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A CLARIFICATION OF FUNDAMENTALS PERTINENT TO THE TWEED CONCEPTS

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IT HAS been written that proverbs are the wisdom of the ages. One has only to scan the writings of a few philosophers, however, to learn that complete agreement on all matters has not always been the rule. Almost every learned saying has an equally learned contradiction. Be that as it may, some wise man once said, "Opinion is the great pillar which upholds the commonwealth." Still another has observed, "Seek till you find and you'll not lose your labor." I heartily agree with both.

There are a good many in the profession of orthodontics who are diligently and honestly seeking, and whose conscientious opinions must be regarded. This is so no matter whether agreement is always present or not.

It is my assigned duty today to discuss one concept of treatment. Let me hasten to remind you that this has been done before, by some far more able than I, and to inform you that I have nothing new to add.

Many of you know that for the past few years I have spent a good deal of time before students and the younger men in the profession. As a result I am well aware of the confusion which exists among them. One must admit that such a condition could be normal for those in such a category, and an attempt to alleviate the condition to a certain extent should not be condemned. While it is not my privilege or intent to act as spokesman for the followers of the Tweed concepts of treatment, it is the intent of this paper to clarify, in my own words, the meaning of the Tweed philosophy.

To practice orthodontics one must, among other things, know what he is trying to attain. He then must be, to the best of his ability, in possession of a method of gaining the objective. This is what has been termed a philosophy of treatment. If this seems a vague or ununderstandable term to some of you, may I suggest that you examine your own mind as to what you are trying to attain

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in the treatment of your cases. If it is anything but a hit or miss, or a treat and trust to the Lord basis upon which you practice, then you can be pretty well assured that you have developed, good or bad, a philosophy of treatment.

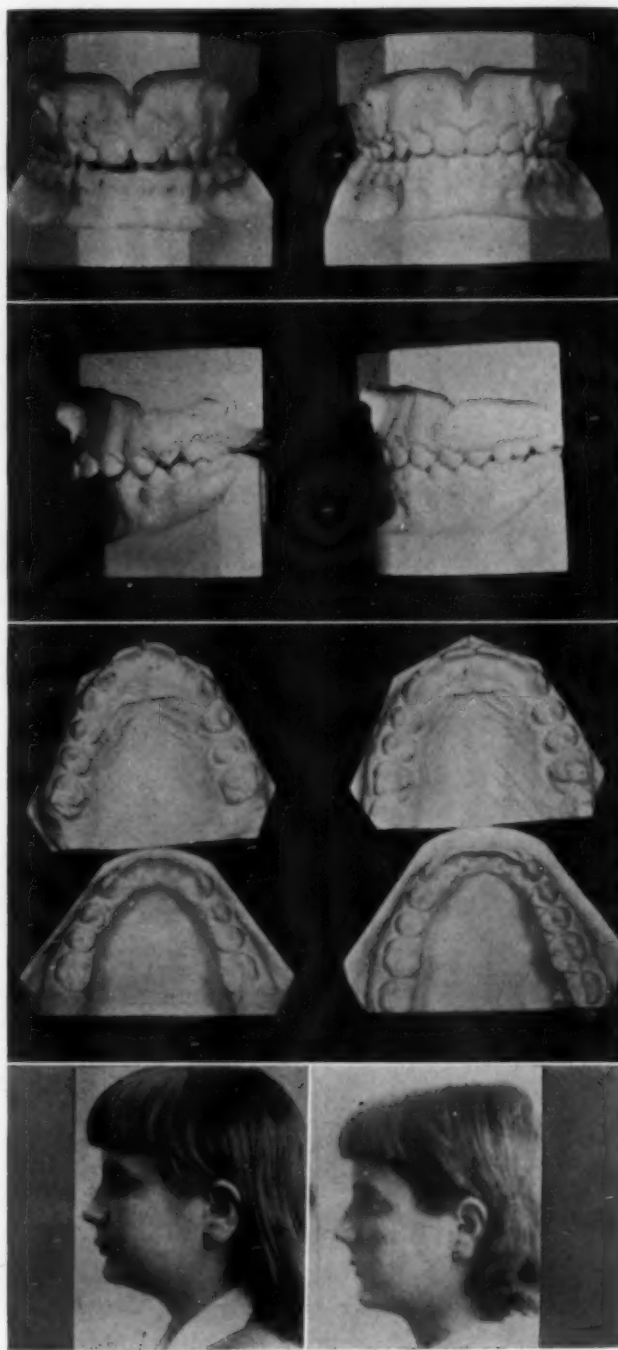
Tweed,²⁰ in his many writings, has really left no doubt as to what his aims and objects are. They can be stated simply and positively. Under his concepts the practice of orthodontics is based on facial esthetics and stability of result. There is no reason why anyone should take exception to a desire to attain the most pleasing facial balance possible in our patients, and, whether it is at all times possible or not, I see no reason why we should not at least try to attain stability of tooth position as a result of our efforts.

Perhaps the most important question in orthodontics today is what constitutes a good result. Agreement on this will never be complete, but the gap of disagreement can be narrowed for the good of the profession. Any discussion of fundamentals must take into account that we are dealing with something, the cause of which is fairly obscure, and to treat anything successfully, the cause of which is not understood, is difficult to say the least.

To justify one's stand on any issue requires nothing more than to sum up a few reasons which point to what, in your opinion, is right. It was Allan Brodie, I believe, who said in effect, in a paper as yet unpublished, that there are enough half truths on every side of the orthodontic picture to paint it in any color one wishes to view it.

It is right to say that Tweed²⁰ evolved his philosophy of treatment, and based it primarily upon clinical experiences. There is no need here to restate each step in the formulation of this philosophy. As time has gone on, however, his clinical theories and practices have been borne out by others in the field of research. Of great importance is the realization that the development of this philosophy began approximately twenty years ago. At first Tweed was the sole worker, but for the past ten to twelve years a good many have conducted their orthodontic practices according to his concepts. To whatever scientific facts the concepts may be related must be added the overwhelming mass of clinical material which has been gathered over these years. The student or the young man of the profession would do well to avail himself of the opportunity to inspect this material, either in the offices of men who have followed the concepts, or in the displays of study groups. It is rather difficult to take this mass of evidence lightly. It might be significant to state here that the aims and objects of treatment remain the same today as they did in the beginning. There have been, however, some changes and refinements in technical procedure.

At the outset Tweed²⁰ made it known that facial esthetics was a major point in his philosophy. Most of you are familiar with his ideal face as he described it in his early writings. At the time many did not agree with this ideal, pronouncing it too flat or with too much Class III tendency. Agreement of this point is not necessary, as we are all, whether followers of Tweed or not, entitled to our own concept of an ideal face, within certain bounds.



A.

B.

Fig. 1.—Case 1. Class II, Division 1 malocclusion, treated without the removal of any teeth. Active treatment, eleven months. *A*, Models and profile photo before treatment; *B*, models and profile photo at end of retention. Upper Hawley retainer worn eight months. No lower retention.

Important here is a statement made in an earlier paper, by me,¹⁷ entitled "The Face in Orthodontic Diagnosis." "... Tweed selected this face because he liked it. There were so far as I know, no measurements, no cephalometric appraisal, no study of developmental trends which entered into this selection, it just represented an ideal."

The orthodontist today has more than an ideal to aid in his diagnosis and treatment plan, but time of course will not permit a detailed account of all the research, the results of which can be applied to case analysis. Let us briefly review a few valuable contributions.

Hellman⁷ has been responsible for some of the good early work done with regard to facial form. He described three types of faces which could be said to fall within the range of normal. In doing this he showed the convex, the straight, and the concave profile.

Everyone here is familiar with the composite tracing of Broadbent's¹ face of the normal child. Here we have two investigators working with entirely different material. Hellman was restricted to anthropologic measurements on skulls, and Broadbent, who developed and made use of the cephalometer, recorded his data on the living head. Others have made good use of this instrument since then to aid in the study of facial form.

At this point it might be well to inject a statement by Wylie²⁴ in an endeavor to show why faces "get that way." He put it in very good terms when he said: "Among students of human craniofacial morphology, many of whom are orthodontists, there is a growing conviction that there is no such single entity as a "normal" facial pattern, and that dentofacial anomalies are in a large measure occasioned by a random combination of facial parts, no one of which is abnormal in size when taken by itself, but each one of which may fit badly with the other parts to produce a condition which may be called dysplasia." Brodie⁴ has written in essentially the same vein.

It remains necessary, however, for the orthodontist to have a clear picture of his objectives and an understanding of the so-called normal. With that in mind I would like to mention the contributions of Downs, Margolis, and Tweed to the studies of facial form and their practical application to orthodontic diagnosis and treatment.

The work of Downs⁶ and Margolis¹¹ was accomplished by the use of positioned head roentgenograms, while Tweed²¹ conducted his investigation by measurements upon the faces and heads of his patients.

Downs' investigation was most comprehensive and too detailed to do much more than mention here. It allows one, however, to study facial patterns in an orderly fashion and is an invaluable aid in helping one to formulate his objectives. Most helpful is the information contained in the fifth paragraph of his summary: "The relationship of the denture of any case to its skeletal pattern can likewise be compared with known relationships of good balance and harmony. Such analysis tends to point out the desirable tooth movements indicated in treatment."

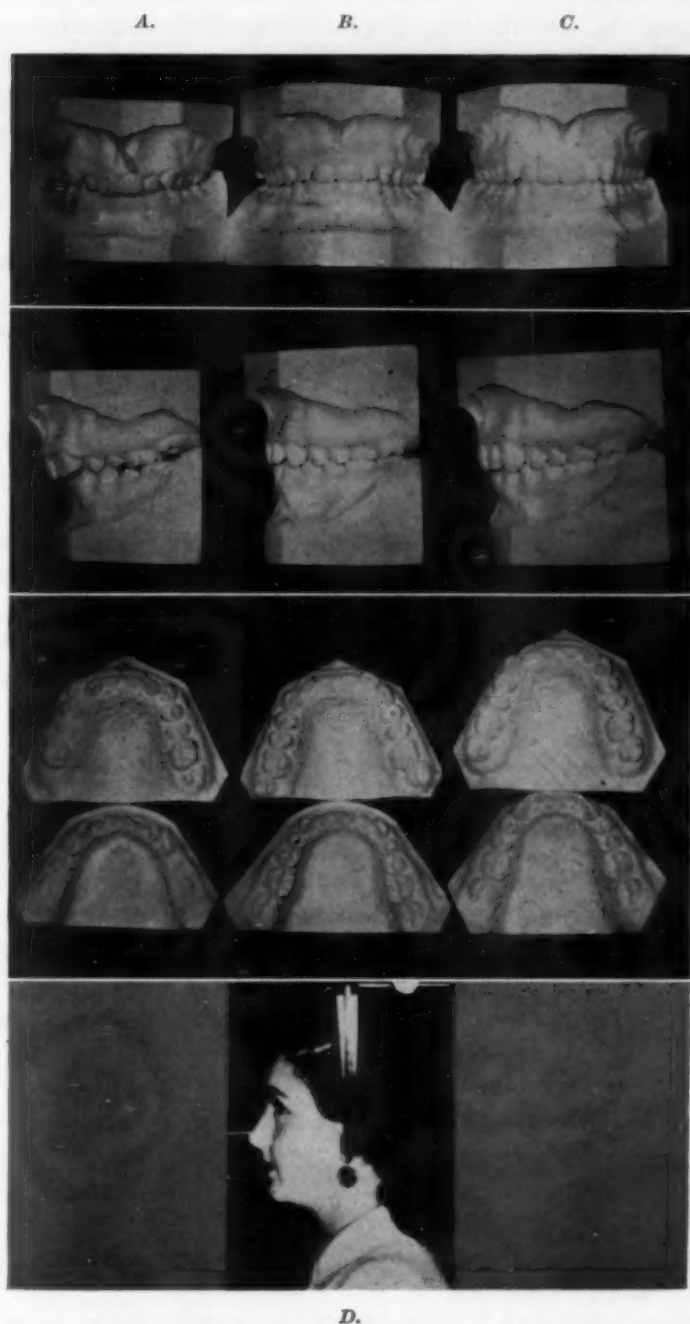


Fig. 2.—Case 2. Class II, Division 2 malocclusion treated without the removal of any teeth. *A*, Before treatment; *B*, after treatment; *C*, five years after treatment. Upper and lower retained one year after active treatment. Active treatment required fifteen months. *D*, Taken same time as *C*.

Margolis, by making use of cranial base lines on cephalic x-rays, has shown the construction of what he terms the maxillofacial triangle. I concur in his observation that by availing oneself of the information contained in his study, the maxillofacial triangle can serve a very practical purpose in clinical orthodontics. In so doing one sees immediately certain relationships which point to the degree of facial balance present, and the part that tooth position plays in this facial balance.

Lewis,⁹ through personal communications with Margolis, brought out that Margolis¹³ has, in a measure, distinguished between bimaxillary protrusion and bimaxillary prognathism, bimaxillary protrusion being a condition brought about by incorrect orthodontic treatment whereby the teeth of both jaws are moved into protrusion, and bimaxillary prognathism being a type of individual in which the lower part of the face, both jaws, project beyond the face.

Clinical experience and observation lead me to state that there are varied degrees in which either of these may be found, however. There are a good many untreated cases which more nearly simulate bimaxillary protrusion than bimaxillary prognathism, and one should learn the possibilities as well as the limitations of orthodontic treatment before definite conclusions are drawn as to just what should or should not be done about it in the matter of treatment. The word type as it applies to the face covers a good deal of territory as well as a multitude of sins, and it is my honest opinion that, whether it be natural or orthodontically produced, there is no reason why type should not be improved upon if it needs it and it can be accomplished.

Tweed,²¹ on the other hand, chose to gather material by clinical observation over a period of years. As a result he brought out, in 1946, his conclusions based on the Frankfort-mandibular plane angle. This angle is formed by the intersection of the Frankfort horizontal plane extended distally beyond porion and the plane of the lower border of the mandible with the teeth in occlusion. It may be done on the face of any patient without the use of more than the hands and a ruler, although others, principally Salzmann,¹⁶ have devised instruments for these measurements. Of very practical use to the orthodontist are the conclusions drawn as a result of this clinical study. It was found that virtually all human beings would present a Frankfort-mandibular angle of between 16° and 55°. That prognosis is excellent nearest the 16° extreme to good nearing 28°. That prognosis is good at 28° to fair at 32°. That prognosis is fair at 32° and not favorable at 35°. And from the 35° angle where prognosis is not favorable it is practically nil as it approaches the extremes of 45° to 55°. Here it should be stated that the Frankfort-mandibular plane angle can be taken from lateral head x-rays as well as by Tweed's method. The same conclusions will apply, with some variations.

Certainly one of the high points in the Tweed concepts is the axial inclination of teeth and the relation of teeth to their respective jawbones. Carrying this to still a more specific point is the insistence by Tweed^{22, 23} that the lower incisors be placed and/or maintained in an upright position at or near a 90° angle to the lower border of the mandible. This in itself could be written on at length, but only a few essential points need be brought out.

Most of those who have followed Tweed's beliefs have agreed that facial esthetics and stability of result have been enhanced by placing the lower incisors in what Tweed has described as the $+$ or -5° to a 90° angle to the lower border of the mandible.

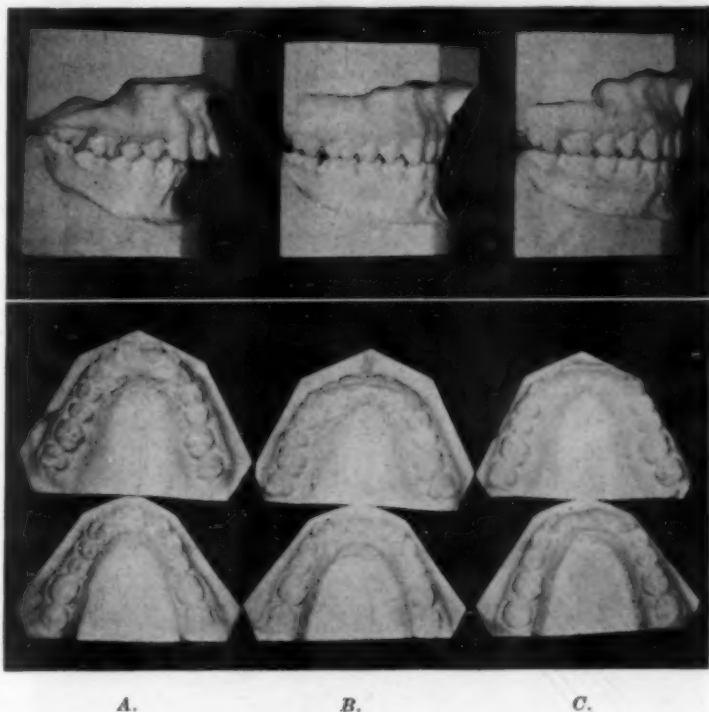


Fig. 3.—Case 3. Class II, Division 1 malocclusion treated without the removal of any teeth. *A*, Models before treatment; *B*, after treatment. Case retained fourteen months. *C*, Models three and one-half years after retention was discontinued.



Fig. 4.—Case 4. Lower of Class I case. First premolars were removed. *A*, Model before treatment; *B*, model three years after treatment. No retention used.

Here again was a clinical observation by Tweed, and something which represented an ideal, yet he made use of no x-ray or other measurements in his study. It might suffice to mention here that early independent investigations by both Brodie³ and Broadbent,² while not originated for the purpose of studying incisor-mandibular plane angle, resulted in some interesting data. Brodie found in the eleven normals where both crown and root of the lower

incisor were traced that the range of the incisor-mandibular plane angle was between 83.5° and 92° with six of them falling at the 90° level. In the Bolton study reported by Broadbent the 3,500 cases studied showed an average incisor-mandibular plane angle of 87.9° .

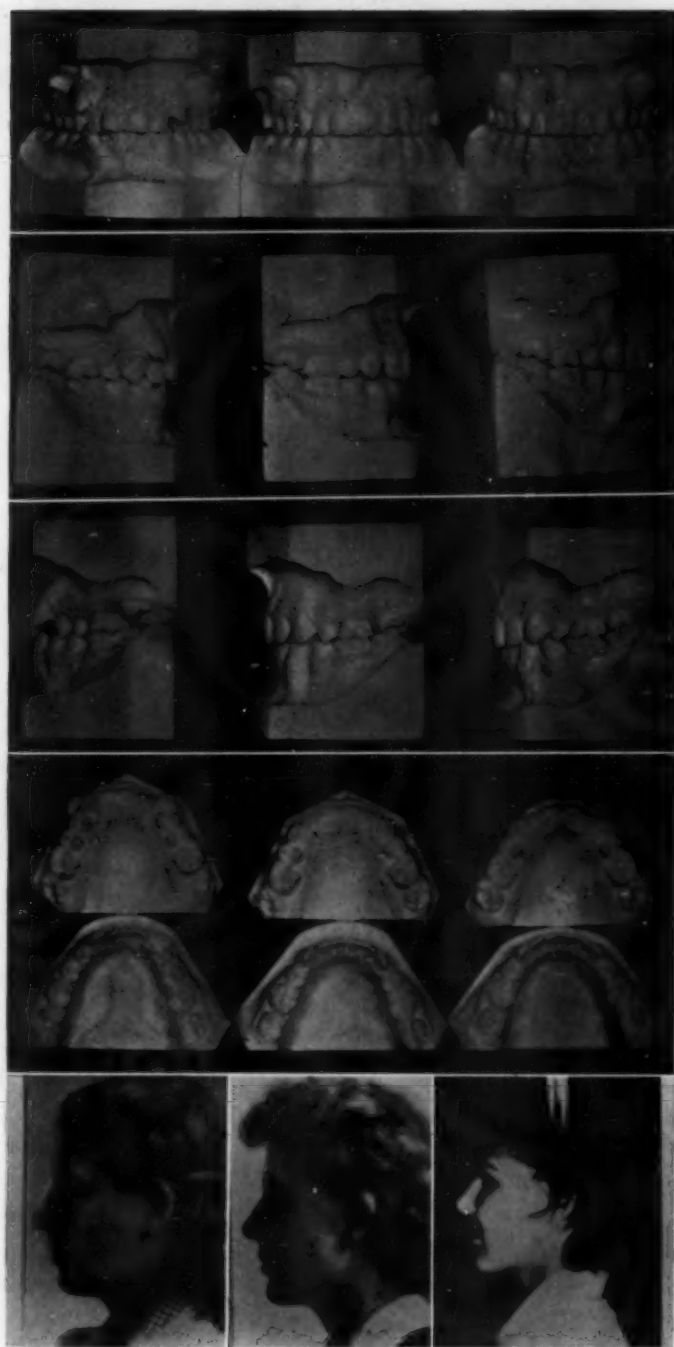
Since the report of the two studies mentioned, however, some very interesting information in this respect has been compiled. I have reference first to the work done by Margolis¹² on the axial inclination of the mandibular incisors. This was an investigation designed especially for the study of the relationship of lower incisor to the mandibular plane. In his paper on the Frankfort-mandibular plane angle Tweed²¹ stated: "He [Margolis] further found that in most white children with normal dentitions and nonprognathous faces, the mandibular incisors were at right angles to the mandibular plane and therefore the incisor mandibular plane was 90° and the variation was less than 5° either way in 90 per cent of the 300 children examined."

Further significant data may be found in referring back to Downs¹⁶ work on facial relationships. Many measurements of the facial structures were taken in this study, only one of which had to do with the "Axial Inclination of the Mandibular Incisor to the Mandibular Plane." The first three sentences under this heading read as follows: "A number of studies have been reported on this relationship (Margolis, Noyes, Rushing, Sims and Speidel) with a general agreement on ranges and on a mean of 90° . Our control group yielded a mean of 91.4° . The difference in the mean can be accounted for by the slightly different method of locating the mandibular plane."

In any discussion of tooth positioning the question of expansion of dental arches must arise. In this respect it has been found by those who practice the Tweed concepts, and with those ideals of treatment in mind, that little or no expansion is permitted. It will be remembered, however, that in the early days of the Tweed philosophy expansion played a major role. In the endeavor to position anterior teeth in an upright manner, and to hold extraction of teeth to an absolute minimum, expansion of the dental arches was resorted to in a majority of the cases treated. Sufficient time has now elapsed to evaluate results, and to say that most of us are not satisfied with the results, either from a standpoint of esthetics or stability where expansion has been employed as a treatment procedure. Strang,¹⁹ Carey,⁵ Nance,^{14, 15} and Howes⁸ have all written on this subject. Strang has tested his theories in regard to this by the elimination of retaining appliances. As a result he states: "There is no question in my mind that denture expansion as a treatment procedure in the correction of malocclusion should be discarded and every effort should be directed toward preserving the muscular balance that is the most important factor in establishing and maintaining tooth positioning."

In this respect I might add that retention of any kind has been held to a minimum in my own practice and the results are gratifying.

No discussion of Tweed²³ concepts would be complete if treatment procedures based on removal of dental units were not included. It is hoped that by this stage in the paper the reader will be aware that those who follow these



A.

B.

C.

Fig. 5.—Case 5. Class I malocclusion. Four first premolars were removed. A, Models and profile photo before treatment; B, the same after treatment; C, the same four years after treatment. No retention was used.

concepts really have a goal toward which they strive, and that the concepts have some bases in fact. In his discussion on prognosis Tweed made the following statement: "By prognosis I mean the attaining of, or as nearly as possible the attaining of, all four orthodontic objectives which, I feel, all orthodontists should strive for.

"These are:

- "1. The best possible in facial esthetics.
- "2. Permanency of end result.
- "3. An efficient masticating apparatus.
- "4. Longevity of the dentition."

It is not necessary to restate the many scientific claims that have been made to substantiate the extraction of teeth in orthodontic treatment, other than to say that there are so-called facts to which the serious student may refer. These have been set down at length by Tweed,²³ Lewis,^{9, 10} and others. Downs,⁶ in a report on his research on facial variation, made this very pertinent statement: ". . . Serial cephalometric analysis of treated cases provides convincing evidence of what we really do with our treatment. It shows beyond question that our present abilities with Orthodontic appliances are not equal to restoring or maintaining balance and harmony of the component parts of the face without sacrificing dental units in many cases. It serves to clarify the limitations of appliance therapy."

It would be to the point to say that when one has become sure of his ideals he then bends every effort to arrive at them. We have spoken of facial form and of position of teeth. It follows then that insofar as the Tweed concepts are concerned we believe in arriving at an objective, and if it cannot be accomplished with a full complement of teeth, then removal of certain dental units should be resorted to.

One fact seems to stand out above all others in this discussion. May I refer back to what was said in a previous paragraph in regard to the many years which have gone by since the birth of this philosophy. The time has been sufficient to allow a fairly complete analysis of the mass of clinical evidence which has been gathered. To whatever stock one chooses or does not choose to place in the scientific research supporting extraction of teeth as a treatment procedure, one must add this clinical evidence.

Some mention of mechanics is inescapable. Just as there are biologic fundamentals that are pertinent to the Tweed concepts, there are mechanical fundamentals also.

It is my opinion that anchorage remains the biggest word in mechanical orthodontics. To understand forces and their control is an absolute must for the practicing orthodontist.

Since the beginning Tweed has emphasized the position of mandibular teeth. Clinical experience has taught those who have followed these concepts that to follow his teachings in this respect has been of great value in helping to attain our objectives of treatment.



Fig. 6.—Case 6. *A*, Sectioned model, profile model, and profile photo of an orthodontic patient treated elsewhere previously; *B*, the same patient three years after retreatment; four first premolars were removed; no retention was used after retreatment.

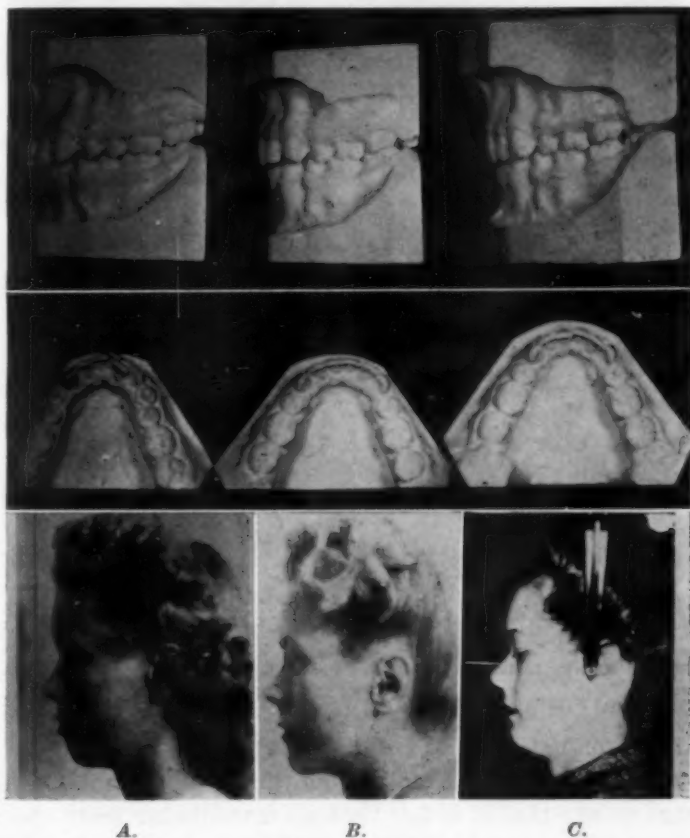


Fig. 7.—Case 7. *A*, Profile model, lower occlusal (showing relapse) and profile photo of a treated case; *B*, the same after retreatment; *C*, four years after retreatment with no retention; four first premolars were removed before retreatment.

In most orthodontic treatment the positions of the mandibular teeth have been accepted as a guide in occluding the maxillary teeth. This has been so regardless of the relation of the mandibular teeth to their base bones, even though in many cases this relation is as far from good as the corresponding relation of maxillary teeth. Yet in most instances we call upon these mandibular teeth to act as anchorage units to withstand the force of elastics sometime before the completion of treatment.



Fig. 8.—Case 8. *A*, Front and occlusal upper and lower model of relapse of a case treated elsewhere previously; *B*, after retreatment; *C*, three years after retreatment. No retention after retreatment. *D* taken same time as *C*. Four first premolars were removed before retreatment.

In an earlier paper on anchorage I¹⁸ described in detail, as has Tweed,²² the various reasons for, and methods of, repositioning mandibular teeth. It will suffice here to say that it is felt that all mandibular teeth should be carried at least to an upright axial inclination, and with a slight distal tipping of the anchor teeth. The purpose is to place mandibular teeth in their most favorable position to withstand any tendency to be displaced further forward dur-

ing treatment. It is because this last has happened too frequently that Tweed was led to conclude that our efforts have resulted oftentimes in merely substituting one malocclusion for another.



Fig. 9.—Case 9. Class II, Division 1 double protrusion malocclusion. Relapse of previous treatment elsewhere. *A*, Models and profile photo of relapse; *B*, models and profile photo after retreatment; *C*, models and photo four years after retreatment and three years after retention was removed. Four first premolars were removed before retreatment.

It is not the purpose of this paper to contribute to the controversy of appliances, their merits or demerits. We observe certain mechanical principles, however, which can be set down.

From a general viewpoint it can be said that in so far as the goals of treatment are concerned one must be in possession of a means or a method of attainment. There are specific mechanical advantages to be sought, however. It is my opinion that any appliance should be able to control any one or all of the seven positions of malocclusion in which we find a tooth or teeth. This



Fig. 10.—Case 10. Class I malocclusion. Four first premolars were removed. *A*, Models and photo before treatment; *B*, after treatment; *C*, approximately eight years after all appliances and retainers were removed.

includes the possibility of influencing the axial inclinations of all of the teeth in both the anterior and buccal segments, to their best mechanical, functional, and esthetic advantage. At this point it should be emphasized that because of the word stationary the term stationary anchorage has often been misinterpreted, and some feel that because of rather ridged attachments, anchorage units can be maintained without further regard. Let me say here that it can-

not be brought out too forcefully that there is no such thing as true stationary anchorage within the mouth. To those of you who look upon anchorage as an important orthodontic treatment consideration, the control of the axial incli-

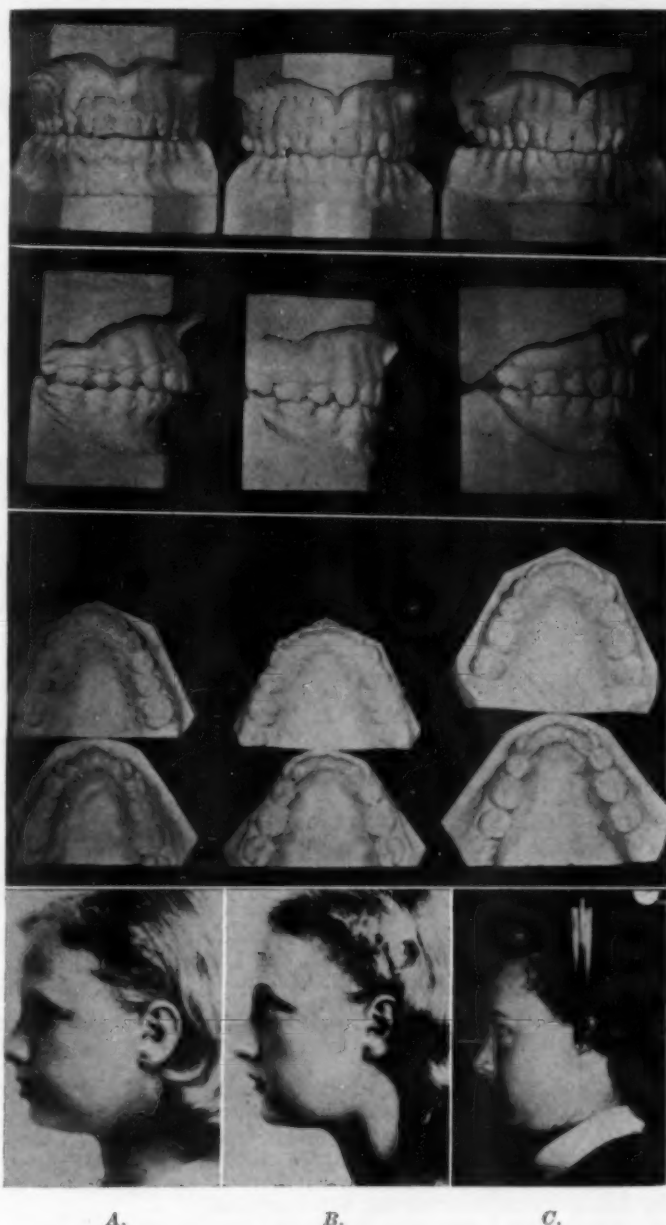


Fig. 11.—Case 11. Class II, Division 1 double protrusion. Four first premolars were removed. *A*, Models and profile photo before treatment; *B*, after treatment; *C*, approximately ten years after all appliances and retainers were removed.

nation of teeth is of primary interest. Further it is felt that the possibilities of the appliance should include that of being able to level out the occlusal plane at the will of the operator.

It should be quite evident to anyone of even limited experience that there is more than one way to move a tooth or teeth. The understanding of this will preclude any possibility of laying down hard and fast rules for appliance selection in any philosophy of treatment. There have been some rather erroneous impressions given, however, in respect to appliance possibilities in general, and appliances in relation to the Tweed concepts in particular. There is no magic in mechanical orthodontic treatment, nor is there anything automatic about it. It is a matter of simple mechanics. Any orthodontist can figure out the relation of a piece of wire to a tooth or a banded attachment to a tooth if such be used. In so doing it should then be not too difficult to determine the limitations and possibilities of the appliance of his choice. The degree of skill with which any appliance is put to use is most certainly of extreme importance. However, it would be a mistake to believe that one's choice of appliance technique could avoid the removal of dental units in a case which otherwise might require it.

The cases seen in the photographs will serve to illustrate the main points under discussion in this article. The patients were all treated according to the technique and philosophy about which Tweed and others have written many times. It is felt that, with one or two exceptions, the cases have been either released without retention or out of retention long enough to make the result worthy of evaluation. The legend under each will suffice to explain the illustration.

Some have the impression that the Tweed concepts and the mechanics used with these concepts are dogmatic and static, and that they permit no self-thought. Please let me hasten to assure you that this is not so. It is felt that a plan of treatment, worked out before treatment begins, in accordance with a knowledge of what one has to work on, and the tools with which one has to work, all pointed toward an ideal or goal, is an invaluable aid to the procedure which one is about to undertake. Beyond this the only dictates laid down are by the one who is doing the job.

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PLAZA MEDICAL BLDG., 315 NICHOLS ROAD.

THE SPLIT TUBE AND LOCK, AND SWIRL TUBE ATTACHMENTS

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THE treatment of malocclusion consists of changing the abnormal relationships of the teeth and the jaws to a normal relationship. A change in relationship implies a change in position, and a change in position represents motion. Motion can be imparted to a body at rest by the application of a force; accordingly, the teeth which are at rest in relation to the supporting structures can be made to move by exerting controlled pressures upon them. These controlled pressures, or applied forces, may be of several different characters. The various mechanical devices in use at the present time apply forces to the teeth in different manners, and thus bring about different kinds of tooth movements.

The recognition of the various kinds of tooth movements induced by these mechanical devices is very important, for the intelligent selection of a working appliance depends upon a full understanding of appliance action. Thus, it is made clear that the selection of an appliance is governed entirely by the required tooth movements.

It has never been pointed out that there is an inherent tendency on the part of the teeth to move into normal positions. While this does not always take place, this tendency is clearly recognizable in all instances. Malocclusions are the result of the failure of the teeth to move into normal positions. The development of the specialty of orthodontics may be traced directly to this characteristic tendency of the teeth to align themselves properly.

The early orthodontic appliances depended almost entirely upon this tendency. The plain labial appliance is a final expression of these earlier attempts, and its successful operation depends upon the ability of the teeth to move into normal positions. It is possible to bring about all the required tooth movements by the plain labial appliance, such as buccal or labial, lingual and mesiodistal tipping movements, bodily movements, root movements and rotations; but many of these changes cannot be explained on a mechanical basis and cannot be directly attributed to the appliance.

As a result of this characteristic property of the teeth, a very large number of cases can be successfully treated by the plain labial arches, and with little effort almost all movements may be effectively produced. There are a number of instances, however, where the plain labial appliance proves to be inadequate. The inefficiency of the appliance and the lack of force control become apparent, and other devices must be resorted to in order to attain a desirable result.

Presented before the Northeastern Society of Orthodontists, Nov. 6, 1950, at Washington, D. C.

The lingual appliances are usually less efficient than the labial arches; nevertheless, they can be used for a variety of purposes with satisfaction. Appliance action is always supported by the tendency of the teeth to move into normal positions. Here, again, the tooth movements which take place in response to the action of the lingual wire cannot be explained by means of mechanics. All this indicates that many cases can be treated with the simplest

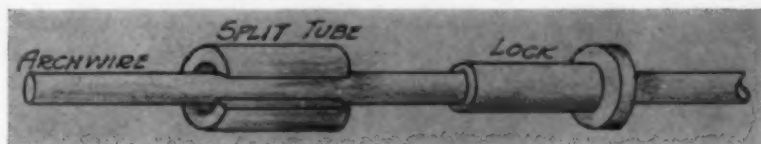


Fig. 1.

Fig. 2.

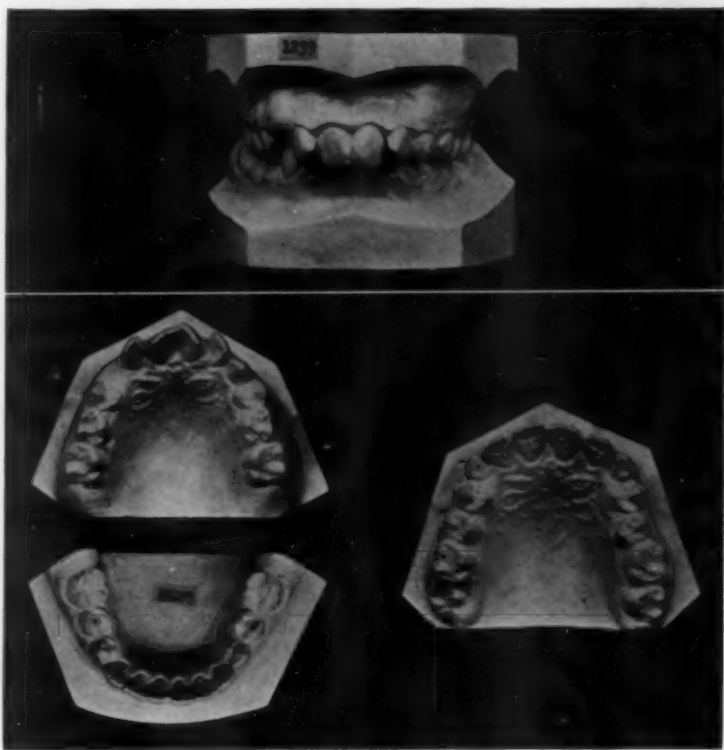


Fig. 3.

types of appliances, and that the use of the more efficient multibanded techniques is not a necessity. It is for this reason that many operators use the labial or the labiolingual techniques with satisfaction. The subconscious approach is that it is expected that with a few exceptions the teeth will find their position under the stimulating influence of treatment. Those teeth which do not follow the general rule are individually considered, and by means of spurs, lugs, rotating arms, and other devices are guided into acceptable positions.

In the multibanded techniques, none of these things are taken for granted. The appliances, and in particular the attachments, are so designed that nearly all tooth movements are provided for in advance. Some of these tooth movements are inherent to the attachments. Thus the angle edgewise bracket will automatically produce mesial, distal, buccal, or lingual root movements, but axial rotations require the use of ligatures. The Johnson twin arch, in addition to mesial and distal root movements, will bring about axial rotations with the greatest efficiency without the use of ligatures. Inasmuch as axial rotations are frequently required, it is desirable to use an attachment which automatically produces rotations.

Fig. 4.

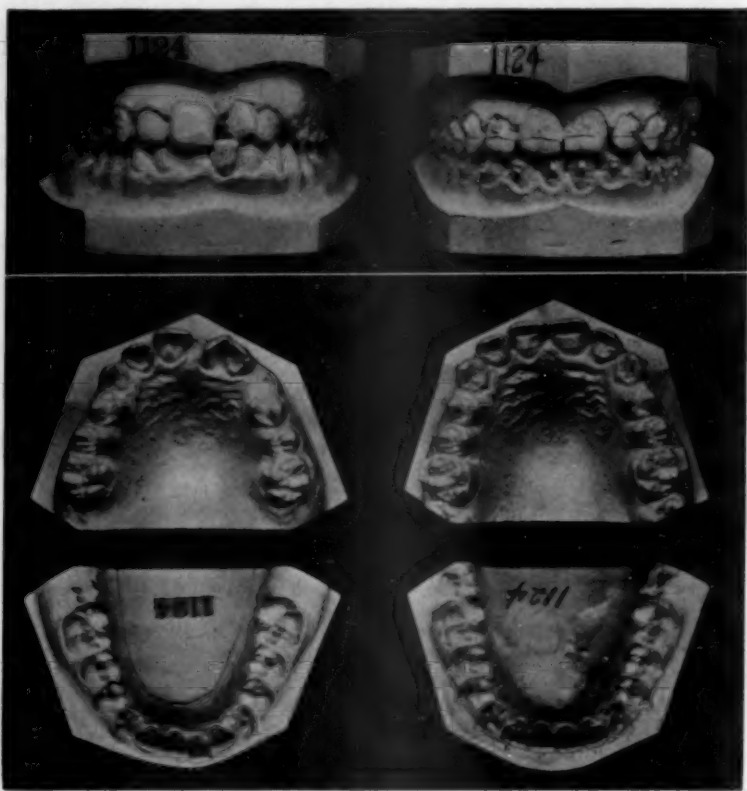


Fig. 5.

The Johnson twin arch brackets are admirably suited for producing axial rotations, but they cannot be used in combination with the other standard brackets. For this reason, two newer attachments were designed which may be used as accessories to the more generally used appliances, such as the edgewise appliance and the modified edgewise mechanism. These new attachments consist of a horizontal split tube, and they differ only in the method of locking the arch wire into the attachment. Their action is essentially the same.

The "split tube and lock" is a combination of a split tube and a smaller diameter closed tube, which is fitted with a collar to act as an arch lock (Fig.

1). The split tube is soldered onto the band so that the slit is placed in a labial position. It is the female part of the attachment. The closed tubes are strung on the arch wire, and after they are properly distributed the arch is snapped into position. Then the locks are easily pushed into the split tubes. The collar on the lock tube acts as a stop, and it is just large enough to lock the two tubes together by friction against the labial surface of the band. The action of this arrangement is very similar to that of the Johnson appliance, but

Fig. 6.

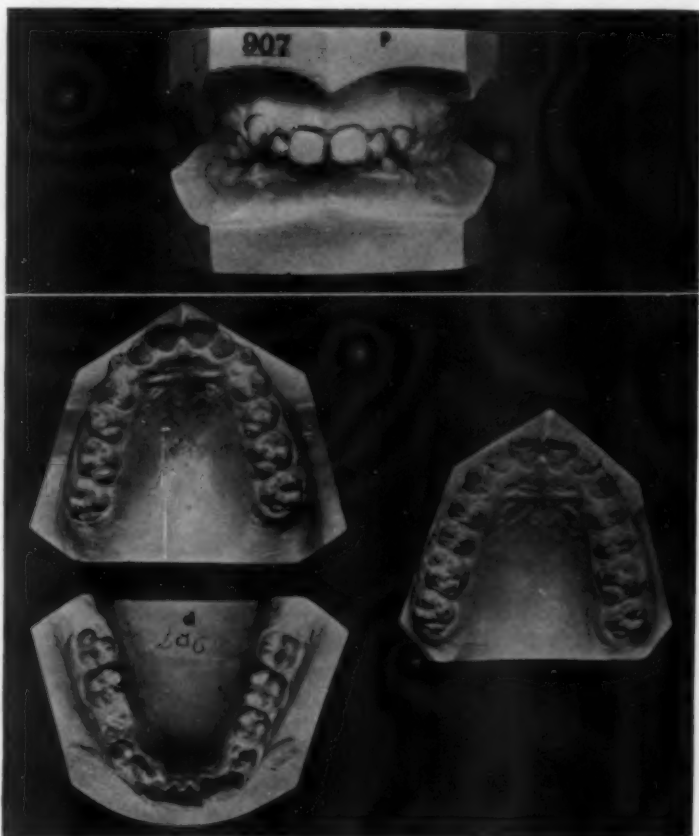


Fig. 7.

it has the added advantage of being an accessory to the modified edgewise arch mechanism; and in this combination there is perfect control over any part of the mouth. The case shown in Figs. 2 and 3 depicts the changes which can be brought about by this attachment. The appliances were placed in the mouth on Sept. 16, 1949, and the impressions for the progress models were taken on Sept. 15, 1950. While the time elapsed is exactly one year, this patient received treatment only for eight months. She was absent for four months during the summer. Another case treated by the split tube and lock is shown in Figs. 4 and 5, which show the changes brought about in less than one year. The appliances were inserted on Dec. 12, 1949, and impressions for

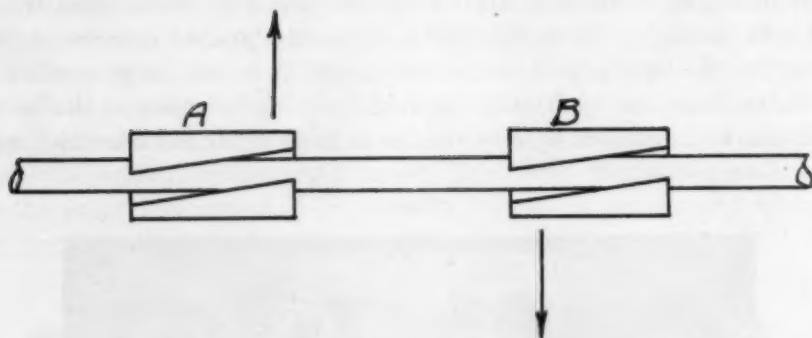


Fig. 8.

Fig. 9.

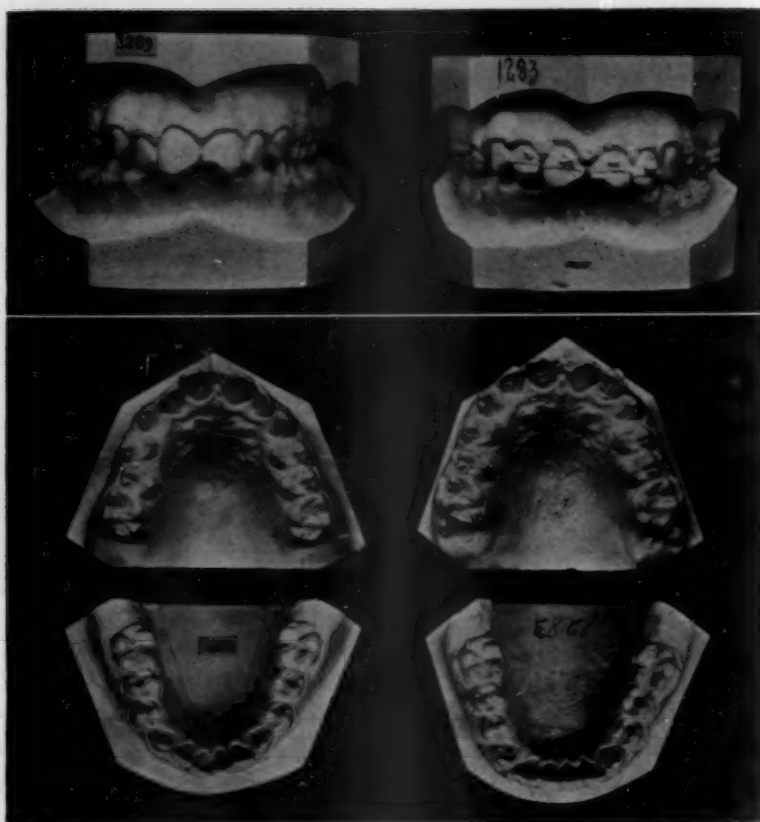


Fig. 10.

the progress models were taken on Oct. 12, 1950. Still another case (Figs. 6 and 7) shows the use of the split tube and lock for the rotation and uprighting of the maxillary canines. When these teeth erupted they were rotated and had a decided mesial inclination. These teeth were corrected in about five months.

Fig. 11.

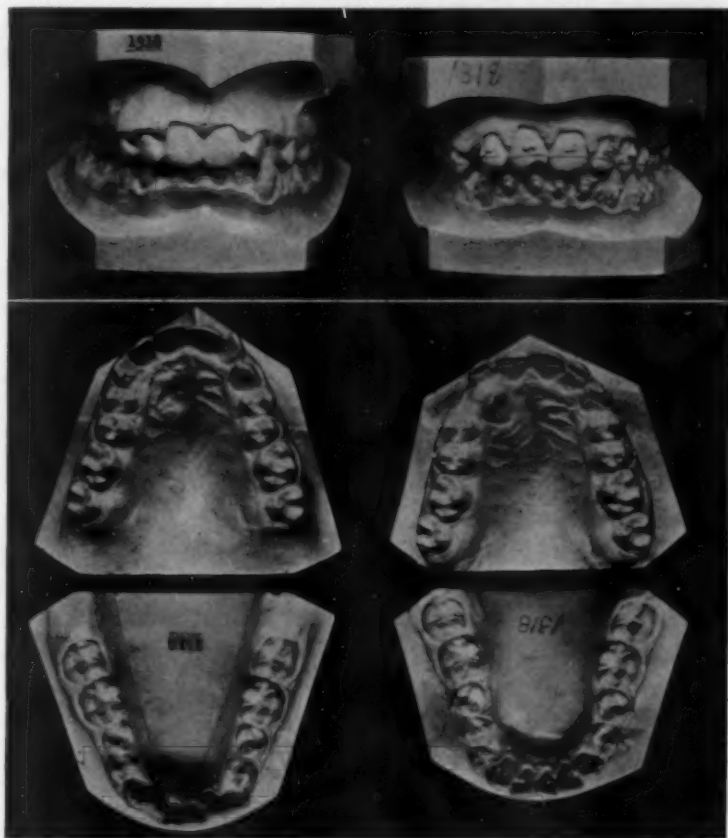


Fig. 12.

The swirl tube is a self-locking attachment. Neither ligatures nor locking devices are necessary to keep the arch wire securely locked in the attachment. It consists of a horizontal tube with a diagonal slit (Fig. 8). Since the inclination of the slit is not very great, it requires only a very slight displacement of the wire from the horizontal to be able to snap it into the attachments. When all attachments are fully engaged, it is not possible to remove the arch wire from the tubes, because each tube acts as a lock for the adjoining tube. In order to remove the arch wire from tube A it would be necessary to displace the arch wire in the direction shown by the arrow. But the adjoining bracket B prevents such displacement; therefore the arch wire is securely locked without the use of ligatures. This self-locking feature is new and novel and to the best of my knowledge has never been utilized in the design of ortho-

dontic attachments. The use of rotating ligatures is completely eliminated, which is a timesaving feature. The results which may be obtained by this attachment are shown in Figs. 9 and 10. This was the first case in which the swirl tubes were applied and they were used on all bands. The appliances were inserted on Jan. 30, 1950, while the impressions for the progress models were taken on Oct. 12, 1950. The case shown in Figs. 11 and 12 illustrates the method of opening a space for an unerupted right maxillary canine, by means of swirl tubes on the five anterior teeth. The appliances were inserted on March 1, 1950, and the impressions for the progress models were taken on Oct. 19, 1950.

The "split tube and lock attachments" were used in my office for the past two years, and the swirl tubes for about six months. I am convinced that they represent a most valuable addition to our appliances. They are beyond the experimental stage and will be used extensively in my practice.

654 MADISON AVE.

TREATMENT PROCEDURES OF SIMPLE FORM WHICH HAVE PROVED THEIR WORTH

GEORGE M. ANDERSON, D.D.S., BALTIMORE, MD.

1. APPLIANCE FOR MOVING LINGUALLY ERUPTED MAXILLARY INCISORS TO NORMAL POSITION

FOR some years I have been using an appliance to move a type of lingually erupted maxillary incisors to normal position. The type is that in which the normal width space for the displaced central or lateral incisor exists and the appliance under this condition is just as satisfactory whether one incisor or four incisors are to be moved. Having had good results with the appliance I thought that others might find use for it since these uncomplicated and often apparently inconsequential things help to make treatment methods a bit easier and beneficial to us.

The lingual eruption of the maxillary incisor ought to be an uncommon thing. Its cause is very often slow decalcification of the predecessor deciduous tooth root. The normal calcifying position of the maxillary incisor is lingual to the root of the deciduous incisor. This positioning is a contributory factor to the lingual eruption of the permanent incisor. In the natural course of events the permanent incisor moves down and forward as eruption progresses, but its proper positioning is dependent upon normal root decalcification of the deciduous tooth. Failure to decalcify or any considerable slowness in decalcification means interference to this very necessary forward as well as downward movement of the permanent incisor. Such interference may result in eventual lingual maxillary permanent incisor eruption. If all goes well the normal position of the permanent incisor as it moves down ready to come in the mouth is directly over the decalcifying deciduous tooth root so that, when that tooth is naturally lost, the permanent successor erupts in the place formerly occupied by the deciduous tooth.

This may all sound elemental or even dentally childish to present to a group understanding the processes of tooth eruption and placement, but the fact remains that lingually erupted maxillary incisors are seen all the time, and somewhere what happens is not understood or it would not happen so much. Under the circumstances the use of the x-ray at about 6 years of age will indicate to the general dentist or the orthodontist whether slowness of decalcification exists or whether the rate of permanent tooth eruption is overly fast. There is a tight schedule between the rate of the deciduous tooth root decalcification and the eruption of the permanent successor. Failure to coordinate means trouble. The permanent incisor usually ends up in a lingually erupted position. In addition, we frequently see nonvital deciduous incisors

Presented before the Northeastern Society of Orthodontists, Washington, D. C., Nov. 7, 1950.

resulting from blows and accidents, and these discolored teeth are very slow to lose the root, if they do so at all. Since the dentist knows when baby teeth ought to be lost and the intelligent parent ought to know, there is really little excuse for the problem of lingual incisor tooth eruption to occur. When it does, and the sooner it is noted the better, we have to do something very promptly about it. If the deciduous tooth remains it ought to be extracted at once. If the permanent tooth is allowed to erupt too much it becomes more of a problem to correct, for the tooth will contact behind the lower incisor, and to bring it to normal position the bite or occlusal relationship of the maxillary and mandibular teeth will have to be extensively separated to eliminate interference as the moving central or lateral incisor crosses the occlusal line. Prompt mechanical interference is advocated in this type of malocclusion.

The interference here recommended is a removable plate (Figs. 1 and 2), simple in design, easy to make, comfortable to the patient, adjustable with accuracy and efficiency, and the resulting tooth movement is most expeditious. The making of it out of plastic or acrylic may be done in either of two ways.



Fig. 1.

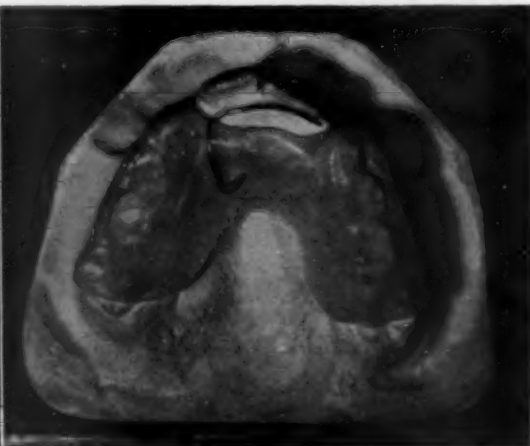


Fig. 2.

The first requisite is an accurate stone or hard plaster cast made from a nondragging impression material, an alginate for instance. The plate form is then developed in wax covering most of the palate and the occlusal surfaces of the canines, first and second temporary molars. By doing this we provide a biting surface which serves to open the bite, and the good fit of the plastic over the occlusal surfaces extending part way up the buccal surfaces serves as a retention medium. In fact, these plates fit so tightly and are made even more so by the closure of the teeth in the act of chewing that it is sometimes hard to remove them. It makes little difference if a deciduous molar or canine is decayed or lost. Simply make the plate to fit over whatever deciduous teeth remain. I make it a point to fill in on my cast with plaster any decayed spot or broken tooth area, as a rough spot or overhanging edge makes fit more difficult. But that is a minor matter of adjustment. After you have covered the palate and

occlusal surfaces with wax, you leave a free area lingual to the maxillary incisors so you may embed a piece of spring wire (0.022) in the form of a simple or recurved spring to serve as motive power for the moving of the incisor or incisors. From this wax pattern proceed to finish your plate in plastic. You will be pleased with the mechanical efficiency it possesses, for its stability is assured by the principles inherent in its construction. The spring's ability to provide the moving force is beyond question and the occlusal interference is eliminated by the biting surface covering the deciduous canines and molars.

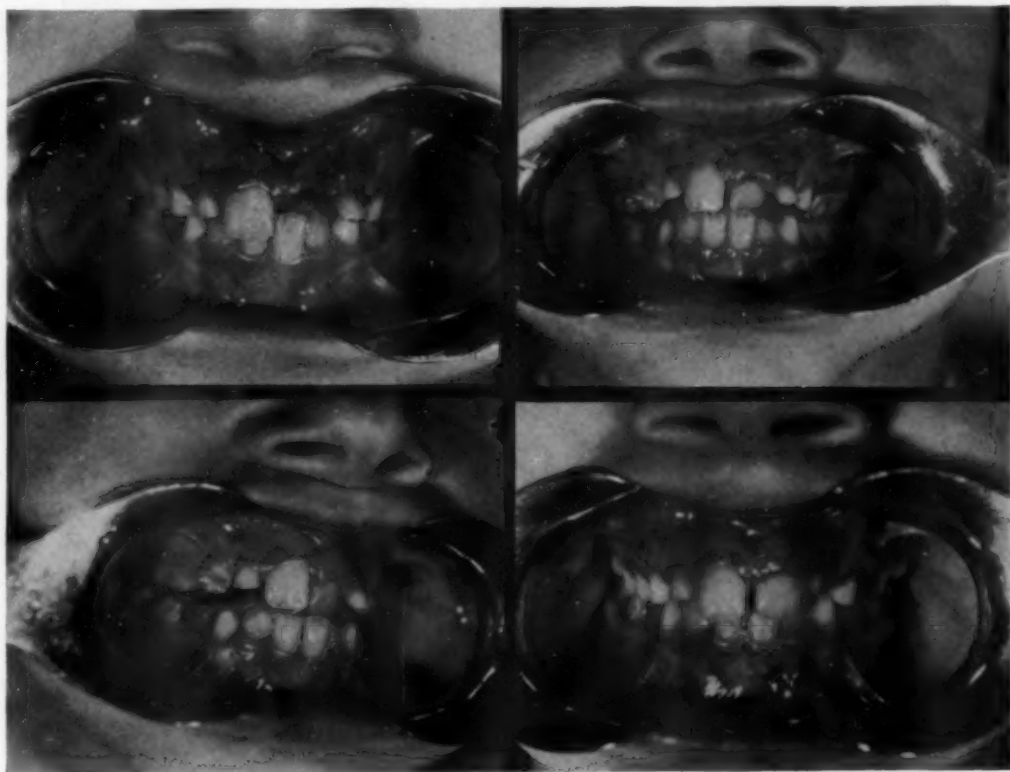


Fig. 3.

The child takes to it readily, and the plate, not being the least bit loose, is kept in far more than are retainers. In fact, the child in biting and chewing helps to keep it on, and therefore has less tendency to flick it off and on with tongue or finger (Figs. 3 and 4). The length of time it is worn to effect the needed change is very short, surprisingly so. The average is about six weeks and when the tooth or teeth are over into normal place, the biting surfaces of the plate may be gradually cut down, allowing the tooth to close labial to the lower incisor, following which in short order the plate may be discarded. The tooth or teeth are thereafter naturally held in place by normal closure and biting. There are no apparent ill effects of the depression type resulting from the covering of the occlusal surfaces of the side teeth, and the resulting pressure from biting.

Earlier in this presentation I spoke of two ways this plate might be made. The second way is by use of coldpack acrylic direct to the model without building up the shape of the plate in wax (Fig. 5). You *outline* the shape in wax, and use that outline as a wall or dam within which your coldpack acrylic is placed. The acrylic soon stiffens and seems to work all right, though I do not like the looks of the material as well, and I have thought the liquid and powder hard on your fingers and nails if you happen to handle it. This second, or cold

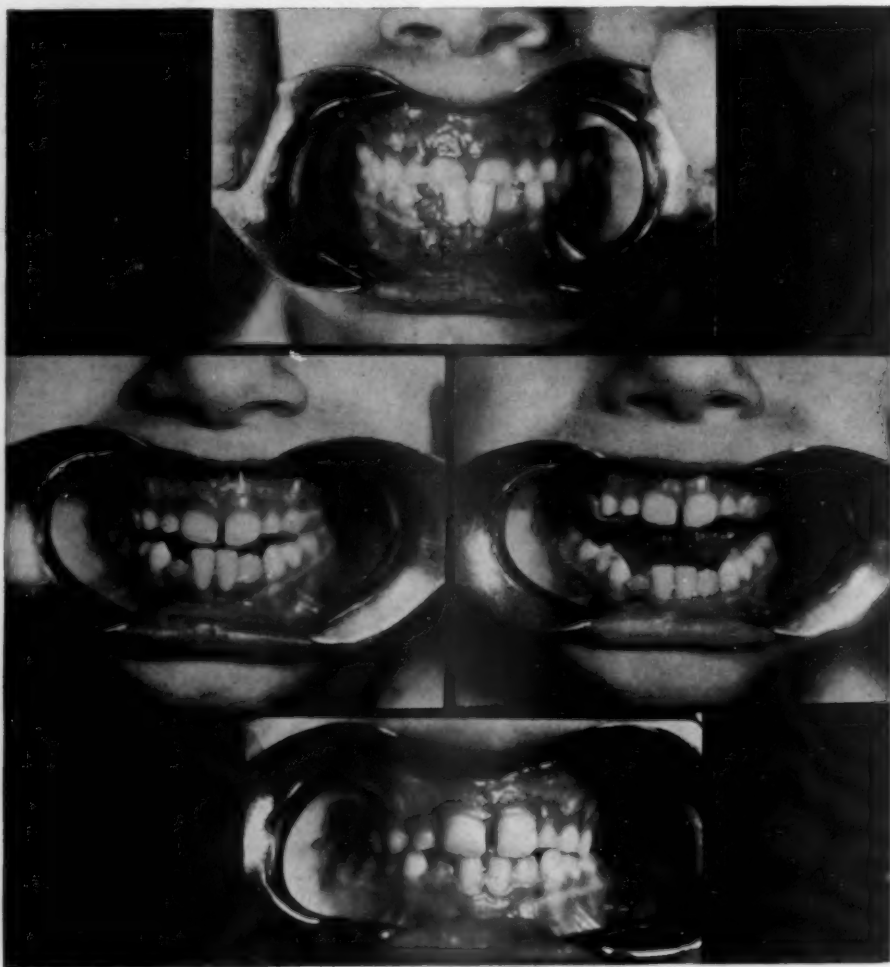


Fig. 4.

pack, way is very quick to make and one can see a patient in the morning and put a plate in that afternoon by making use of the procedure. It eliminates flasking, packing, and curing by heat. Those present who were in attendance at Chicago in May saw commercial and other clinics advocating use of cold pack material.

My general satisfaction with this plastic plate and spring wire made from heat-cured material has made it unnecessary for me to use cemented bands and

labial or lingual wires to move lingually erupted maxillary central and lateral incisors with sufficient space into normal position. I now make use of a similarly constructed plate for "crossing" premolars, and even first permanent molars.



Fig. 5.



Fig. 6.

2. MANDIBULAR REMOVABLE RETAINER WITH INCISOR SPRING

The mandibular retainer of usual form had proved reasonably satisfactory following the removal of cemented appliances, but its proficiency decreased in relation to the cooperativeness of the patient. When certain children would not wear the retainer too well, slight irregularity would occur in the incisors (Fig. 6). To aid in overcoming this tendency I have made all my mandibular retainers with an incisor spring which allows for adjustment to finish incisors evenly and to overcome any slipping which the child has permitted to occur

through failure to wear the plate sufficiently. There has been a marked improvement in my retentive efforts through this simple procedure. Office service, laboratory costs have been lessened. The patient, too, has been better off because correction has been maintained on a better level. Fewer plates have been made over because they did not fit and could not be adjusted.

3. SOLDERED SPRING TO LINGUAL ARCH

The soldered spring is not in reality a spring nor has it the same effect (Fig. 7). Its force is just one of push or wedge, but it does the job and that is what counts. The usual simple spring or recurved spring soldered to a lingual arch has one end free and it is that end which gives the full effect of the elastic spring used in lingual arch technique. The immediate spring area is the one of tooth movement. When you take the same piece of wire you would use for a simple or recurved spring and attach it to the lingual wire throughout the length of the spring by solder, you have an entirely differently directed force.

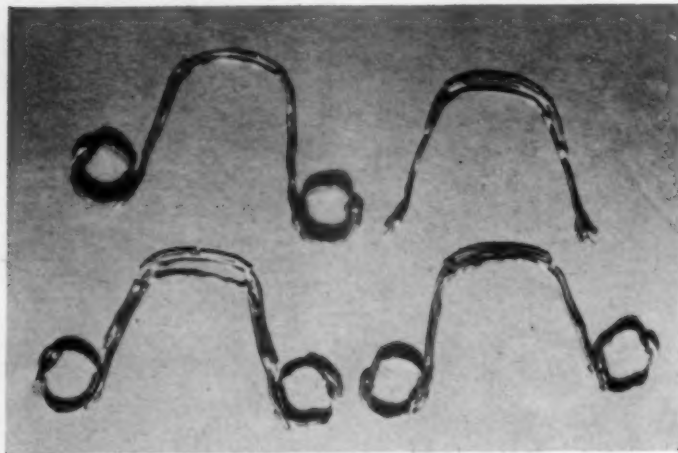


FIG. 7.

In addition, spring displacement and breakage are eliminated. If you solder the wire in the incisor region, you get a fine, slow but positive effect on the incisors and a reactive force through to the molar region. I have found actual space open from distal movement of the molars through the reactive effect of the soldered incisor spring. If you solder the spring wire on either side of the lingual arch so the premolars and cuspids are affected, you get a lateral wedging force with widening effect which has a more pleasing upright effect on the moving teeth than the customary simple or recurved spring.

I attribute this to the position of the soldered spring and the slowness of the movement induced by the wedging effect. Instead of adding other pieces of wire by soldering to obtain the desired activity, I frequently move the single soldered piece outward by melting solder at point of attachment. While this creates space between the main arch wire and length of the soldered spring, this space does not seem to cause food to catch or have other adverse effect.

It is remarkable how much one piece of soldered spring wire can be moved or how much may be added. Arch enlargement is most gratifying. A further benefit seems to be an improved stability of anchorage during the use of intermaxillary elastics. I attribute this to the tightness of the lingual wire within the arch as a result of this form of spring attachment. There is little, if any, slipping forward from the intermaxillary pull which often occurs as a result of the looseness of the lingual wire in the customary lingual arch use.

The procedures I have outlined are truly simple but they serve me well and will, I hope, do so for those who may be sufficiently interested to try them.

831 PARK AVE.

COMMUNITY ORTHODONTIC SERVICE

AUGUSTUS L. WRIGHT, D.D.S., PHILADELPHIA, PA.

AS SOON as public service ceases to be the chief business of the citizens, and they would rather serve with their money than their persons, the state is not far from its fall."

That was the statement of principle of Jean J. Rousseau, noted French writer and controversialist, more than a century and a half ago.

Here in Philadelphia, we are translating principle into action. We are thinking in terms of dental health for families of the most meagre means. Even in today's high employment labor market and record wage levels, there are many who cannot afford specialized dental treatment for their children. Yet, the best things in life cannot be free—entirely.

The spirit of service brought the Philadelphia Mouth Hygiene Association into being on May 8, 1928. This group of civic and professional leaders planned a nonprofit, Community Fund-supported organization to provide dental service for those who, because of limited family income, are unable to obtain dental treatment in a private office.

Twenty-two years later, it is apparent that the wisdom of these leaders created a program both broad and sound in all respects:

1. Dental health education.
2. Preventive and restorative dental service.
3. Orthodontic service for the prevention and correction of dentofacial deformity.
4. Recipient participation in the cost of the service. This requirement is important because it maintains the cooperation of the parent, patient, and orthodontist. It is the connecting link that establishes a relative value.

Remember, all this was planned and put into operation before the late President Franklin D. Roosevelt was elected for his first term, and long before anyone heard of the Wagner-Murray-Dingell Bill. This program is not propped up by Federal, State, or City subsidies nor bound in red tape by Federal, State, or City controls.

In looking over this twenty-two years of service experience, we might divide the program into three subtitles: the men, the mouths, and the results.

Personnel.—This is the most valuable asset in the operation of the orthodontic clinic. They must have a sense of duty and a desire to repay some humanitarian obligations.

More practically, they must have a degree or certificate from a university graduate school in orthodontics. Staff members are chosen to permit representation of as many graduate schools as possible.

Read before the Northeastern Association of Orthodontists, Washington, D. C., Nov. 7, 1950.

At present, the clinic has a staff of seven orthodontists and a nonstaff consultant orthodontist. These men are in attendance a minimum of two mornings a week. Mathematically, their service provides the equivalent of one and one-half orthodontists working thirty-five chair hours each week.

In addition to the orthodontist, the clinic personnel includes a dental hygienist and a clinical assistant, who are responsible for the office efficiency of the clinic. They make appointments, interview parents, make models, take photographs and radiographs. They also keep the financial and treatment records.

The spirit of cooperation existing in the clinic extends beyond its doors into a continuing attitude of helpfulness in other professional interests.

Patients.—The greatest number is referred to the clinic by the branch dental clinics of the Mouth Hygiene Association. Others are sent by orphan homes operated by religious orders and by welfare organizations. Some children are sent by social service workers and school nurses. A small number is referred by private dental practitioners.

Family income is the factor that determines eligibility for acceptance as a patient. If the family income exceeds \$15.00 per person per week, the child is not accepted for treatment. This financial dividing line is obtained by using the Department of Commerce average weekly wage and dividing by four, which represents the average family. It is obvious that this income limit opens our service to the lowest income level.

Information about the family income and name of employer is noted on the application card at the time of preliminary examination. We check to make sure the income has not been understated. This is done by having the parent sign permission for the employer to certify the wage information either correct or incorrect. Financial information is obtained through the Philadelphia Credit Bureau and by income tax return when the applicant is self-employed. Very few in this category are eligible for treatment because of income.

Children accepted for treatment, in addition to the income requirement, are chosen by orthodontic standards of deviation from typical occlusion. A functional and esthetic deviation case is taken in preference to one with lesser anomalies. This is primarily designed to help those most in need of correction, but also to stimulate the practicing orthodontist with work that is both novel and challenging and to enlarge the professional skill of the young orthodontist.

We see a lot of "sad" mouths as well as the usual run of unhappy faces. Most of these children have received inadequate dental treatment or no treatment at all in their earlier ages. For this reason, there is a greater number of mutilated dental arches found in this group than will be encountered in a private practice.

Early loss of deciduous teeth and first molars, with the resulting loss of mesiodistal arch lengths, is the chief offender. The incidence of caries is higher for these patients than those in a private office. Lack of a varied diet

(it used to be meat and potatoes, potatoes and meat; with today's prices we can call it simply overstarching) may have some relation to the number of carious areas.

Clinical Procedure.—Clinical procedure conforms to that in the average private office. Usually at the first visit, family information is obtained. In addition, a dental examination for caries and occlusion is made. After family income has been proved within established limits, more complete orthodontic records are made. In most instances these include: case history, case treatment record folder, either lateral jaw or intraoral radiographs, models, and photographs. When standard fixed position profile radiographs are requested, they are included in the record.

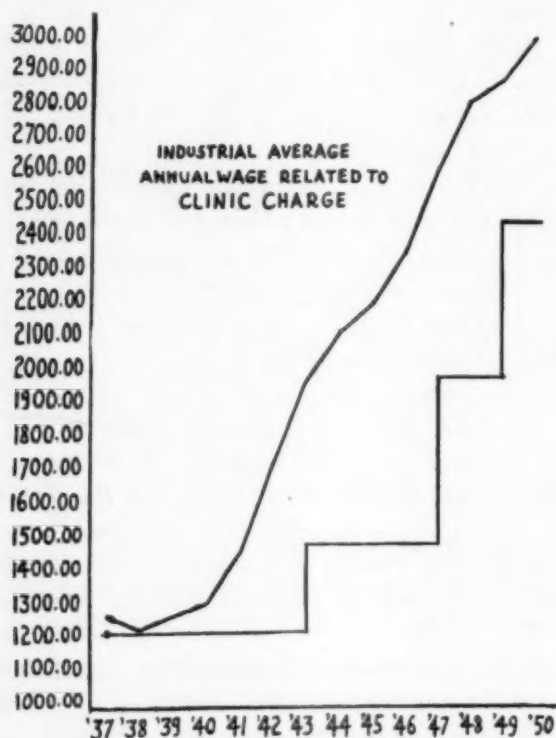


Fig. 1.—Graph showing increase in average annual income and the increase in clinic treatment charges.

The individual orthodontist is given wide latitude in decisions of appliance construction and treatment procedure. Both precious metals and nickel-chrome alloys are used for appliance fabrication. For economic reasons, use of nickel-chrome alloy is encouraged, and is used in both the banded and labiolingual technique. Transition from use of precious metals to nickel-chrome alloy can be accomplished in a short time, without compromise in appliance standards. In most instances, the direct method of appliance construction is found to be practical in the clinic.

The fee scale is set at a point where income will balance expense. Appliance charge for multiple-banded technique is fifty dollars, and for the

linguolabial technique is forty dollars. The monthly treatment charge for the multiple-banded technique is ten dollars, and for the linguolabial technique, eight dollars. There is a five dollar examination charge.

The fee scale has followed the general trend of the national economy, but has been constantly related to average income of persons employed in industry.

Fig. 1 shows the increase in average annual income and the increase in clinic treatment charges. There is a lag between income and charge of about three years. The average yearly wage for the period 1935 to 1939 equals 100 for purpose of comparison.

This statistical information for the year 1949 provides a fair picture of the over-all operations of the clinic. During that year, the staffs' services provided an average of thirty-nine orthodontist chair hours. This represents the service of one and one-tenth orthodontists. (Table I.)

TABLE I. OVER-ALL OPERATIONS OF THE PHILADELPHIA CLINIC, 1949

MONTH	NEW CASES	ACTIVE CASES	SALARIES	EX- PENSES	INCOME	MONTH. NET	OPERATING DEFICIT	NET
Jan.	11		943.27	120.39	1,089.08	25.42		
Feb.	12		871.08	193.63	896.00		168.71	
Mar.	8	186	1,124.21	105.35	1,793.00	563.44		420.15
Apr.	5	191	989.52	181.86	1,153.00		18.38	401.77
May	6	197	924.08	270.35	1,207.00	12.57		414.34
June	10	207	1,024.91	108.85	1,214.00	80.24		494.58
July	8	215	1,099.89	125.49	1,223.00		2.38	492.20
Aug.	8	223	932.70	123.87	986.80		69.77	422.43
Sept.	14	237	1,067.52	75.98	1,744.25	600.75		1,023.18
Oct.	6	242	1,102.37	81.45	1,523.50	339.68		1,362.86
Nov.	4	245	1,068.06	123.18	1,183.25		7.99	1,354.87
Dec.	3	248	1,091.23	.98	1,365.75	273.54		1,628.41
Yearly total	95	248	12,238.86	1,511.38	15,378.63			1,628.41*

*Net charged to rent and depreciation.

Results.—Our community health service project provides orthodontic service for many children who otherwise would be denied treatment. Those who devote their time to the clinic are rewarded. Because of association with fellow orthodontists, a greater effort is made to diagnose and treat each case. Experience accumulated in the clinic has incalculable value in building a private practice.

The men who conceived the Philadelphia Mouth Hygiene Association avoided the error that most Government health plans commit. That error is dissipation of the services on the vote-casting age group, with resulting neglect of children.

The latest information bulletin of the American Dental Association points the lesson in Great Britain. Tremendous adult demand, frequently emergency, crowds the children out in the rush for appointments. "The National Health Service is now in competition with the School Health Service and is winning the battle."

In one British community, Ilford, socialized dentistry provided 3,747 inspections for 21,123 school children in 1949. In 1938, there had been 22,820 inspections for 19,000 children.

American dentistry must profit by the British mistakes, and before it is too late. Without being defeatist, we might anticipate the evil day when Government health service is the law of the land by exerting every possible effort to plan the programs so that children—not adults—will receive preference.

In no small measure will the success of the American dental profession in providing clinics postpone the day of nationalized dentistry, and prevent the distortion of dental service to the detriment of future citizens.

255 S. 17TH ST.

RELATIONSHIPS BETWEEN DENTAL ARCH WIDTHS AND WIDTHS OF THE FACE AND HEAD

HOWARD V. MEREDITH, PH.D., EUGENE, ORE., AND
L. BODINE HIGLEY, D.D.S., M.S., IOWA CITY, IOWA

TO THOSE acquainted with the history of American dentistry, it is a commonplace that the last three decades reflect a growing disposition on the part of orthodontists to "adopt a less tooth-centered point of view when appraising . . . patients and their anomalies."⁴ This is exemplified by two papers (both from the esthetic standpoint) written in 1917 and 1938. The earlier paper deals solely with the dental arch; the art ("good-looking") standard it proposes is a ratio of 14:9 for "the distance between the buccal grooves of the first molars" to "the distance between the points of the cuspids."¹⁸ The later paper regards the relation between width of the dental arch and width of the face "of prime importance"; the art ("pleasing") standard it proposes calls for "the combined widths of the upper incisors and cuspids . . . to measure slightly less than one-third of the greatest facial width at the cheek bones."¹⁴

Whether one examines the literature on orthodontic esthetics or mechanics, diagnosis or prognosis, the trend is seen to have been one of expansion from dental considerations to faciodental considerations, from oral localization to a perspective in which oral problems are visualized in relation to the surrounding anatomy of head and neck and, on occasion, to still broader morphologic and physiologic conditions. A 1918 paper¹⁹ recommends dental arch diagnosis in terms of tooth size (mesiodistal diameters) alone; contemporary papers recommend diagnosis via measurements of face size in addition to tooth size,¹⁰ and consider it important to examine the relations of the dental arches "to the basal bones of the jaws, and of the jaws in turn, to the cranium."⁷

Sense of need often outdistances both delineation of the relevant and irrelevant facets of the need and development of devices or procedures adequate to meet the need. The disposition to consider the relationship of arch width to face width in planning orthodontic treatment—clinically desirable as this may appear—is presently outdistancing substantial knowledge on the variability of the relationship in orthodontically normal individuals. It has been stated, for instance, that where orthodontists have "experienced the collapse of widened arches" these arches have been "overwidened" in the sense that the "constitutionally determined relation" between face width and width of the dental arch has been violated.³ This assumes a body of sound information on the association between arch width and face width in dentally nonpathologic individuals of both sexes at different age levels from early childhood to adulthood.

Does an adequate amount of such information exist? Todd,¹⁷ in a paper reporting the finding that "maximum palatal breadth . . . is reached by ten

years" while bizygomatic (upper face) breadth continues to increase throughout adolescence, concludes, "There can be no close growth-relationship between palatal and bizygomatic breadth." Izard,⁸ on the other hand, claims to have found a "remarkably close" growth-relationship. He writes:

During growth, this index [maximum palatal breadth \times 100/bizygomatic breadth] varies slightly and oscillates around 50. We have verified this at different ages. . . . [However,] the cranial series observed are not very numerous.

Again, there is marked dissimilarity of findings from studies by Meyer¹¹ and Berger.² Both investigated the relationship between bizygomatic diameter and width of the maxillary arch at the first molars, Berger using 30 adults with "complete and normal denture" and Meyer 95 children with "anatomically correct occlusion." The coefficient of correlation is moderately high ($r = 0.88$) from Berger's data and negligibly low ($r = 0.18$)* from Meyer's data. These observations will suffice to point up the need for re-examination and further investigation of the association between widths of the dental or alveolar arches and widths of the head and face.

PURPOSE

The present paper has a twofold objective: first, to report new findings from study of a sample of white American children 5 and 7 years of age and, secondly, to integrate these original materials with related materials assembled from the literature. New findings are reported for width of the maxillary dental arch in relation to width of the upper face, width of the maxillary dental arch in relation to width of the head, and width of the mandibular dental arch in relation to width of the lower face. Comparative materials are drawn from investigations by Bakwin and Bakwin,¹ Berger,² Channing and Wissler,⁵ Izard,⁸ Smyth and Young,¹⁵ Sullivan,¹⁶ Woods,²⁰ and others.

SUBJECTS

The subjects were 82 white children. Original data were obtained on the entire series at the age of 5 years and on 64 of the series at the age of 7 years. All of the children resided in or near Iowa City, Iowa, and were enrolled in the Facial Growth Study.† Invitation to participate in the Study was in no way related to the dental conditions or orthodontic needs of the subjects.

Enrollment information secured through parent interviews characterizes the group as entirely of northwest European ancestry (descendants of immigrants from the British Isles, Germany, Scandinavia, and the Netherlands) and predominantly of above average socioeconomic status (40 per cent in the professional class and the remainder in the managerial, commercial, or skilled trade groups).

*Not statistically significant ($t = 1.79$).

†A long-term research program started by the writers in the spring of 1946 and maintained under the joint sponsorship of the College of Dentistry and the Iowa Child Welfare Research Station, University of Iowa.

SOURCES AND TYPES OF DATA

The following materials, obtained within one week of each child's birthday, were drawn from the Study files:

1. Direct measurements of upper face width (bizygomatic diameter).
2. Direct measurements of head width (biparietal diameter).
3. Casts of the maxillary dental arch.
4. Casts of the mandibular dental arch.
5. Standardized posteroanterior roentgenograms of the calvaria and face.

On the roentgenograms, measurements were made for lower face width (bigonial diameter).^{*} The casts were used for two purposes, to secure measurements of arch width and clinical judgments on normality of arch form.

The roentgenograms, dental impressions, and orthodontic ratings were made by Dr. L. B. Higley. Roentgenographic exposures were made with the subjects carefully oriented in the Higley head positioner,⁶ and dental impressions were taken in an alginate compound especially chosen for its accuracy and ease of manipulation with children. Orthodontic ratings, made strictly without reference to external size of the head or face, were limited to appraisals of the maxillary arch. Two categories of clinical judgment were used: (a) arches recommended for expansion or contraction, i.e., unsatisfactory with respect to width, and (b) arches needing no width modification, i.e., satisfactory or normal. For the 82 subjects aged 5 years, maxillary dental arch width was rated "normal" in 70 and "unsatisfactory" in the remaining 12. For the 64 subjects aged 7 years, the corresponding numbers were 56 and 8.

Dr. H. V. Meredith and Mrs. Helen Bradley, aided by graduate assistants, made the direct measurements of bizygomatic and biparietal diameter. Both measurements were taken with spreading calipers. In taking biparietal diameter, the ends of the calipers were placed against the sides of the subject's head and moved around in a horizontal plane (always above the level of the supramastoid crest) until the maximum width was found. Care was taken to remove any obstacles (e.g., braids, hair clasps) and to separate the hair in the region measured. Bizygomatic diameter was determined by placing the ends of the calipers against the sides of the face at numerous different points along the lateral surfaces of the zygomatic arches. Again the anthropometrist kept the instrument in a horizontal plane, applied firm pressure, and carefully sought the greatest distance in the region. Records for each dimension were obtained routinely by two anthropometrists: where these differed by 1.0 mm. or less they were averaged, while in instances of greater discrepancy both anthropometrists made additional measurements and an average was taken from the four records.

The roentgenogram and dental cast measurements were made by Dr. Thomas X. O'Reilly, Dr. Wayne L. Zeiger, Dr. H. V. Meredith, and Mrs. Helen Bradley. They consisted of bigonial diameter, interbuccal and interlingual diameters of

^{*}An earlier study by Potter and Meredith,¹⁸ comparing roentgenographic and direct measurements, found the former to be preferable in the case of bigonial diameter and the latter in the case of biparietal diameter. Bizygomatic diameter was not attempted on the roentgenogram due to superimposed shadows of the mastoid process, zygoma, and other structures. In this connection, Woods²⁰ recently has described a procedure for approximating this dimension from the roentgenogram.

the maxillary arch at the deciduous second molars, and interlingual diameters of the mandibular arch at the deciduous cuspids and second molars. Bigonial diameter was obtained, after positioning the roentgenogram on a well-lighted viewing table, as the greatest horizontal breadth of the mandibular shadow at the gonion level. Two independent determinations were made: these were averaged in instances where they differed by less than 0.3 mm. and augmented by additional readings in instances of greater difference. The widths of the dental arches were taken as (a) maximum horizontal distance between the buccal surfaces of the maxillary deciduous second molars, (b) minimum horizontal distance between the lingual surfaces of the maxillary deciduous second molars, (c) minimum horizontal distance between the lingual surfaces of the mandibular deciduous canines, and (d) minimum horizontal distance between the mandibular deciduous second molars. These measurements were determined with Boley sliding calipers, using the same standard of precision as described for bigonial diameter.

We have endeavored to show that the methods of data collection were exceptionally rigorous. Great care was taken to insure that each value for a subject would represent a close approximation to the correct or true morphologic value.

RELATIONSHIP OF MAXILLARY ARCH WIDTH TO UPPER FACE WIDTH

Studies presently in the literature have used two methods of studying the relationship between width of the upper face and width of the maxillary dental or alveolar arch. These are the index or ratio method, and the method of product-moment correlation. In order to provide for comparison with each type of study the original data on Iowa City children were subjected to both methods of analysis.

Index or Ratio Approach.—This method portrays the association between arch width and face width in terms of the ratio of one measurement to the other. It is the method underlying such statements as,

... a constant ratio exists between the width of the arch and the width of the face ... an arch must never be given a [maximum interbuccal] breadth larger than one-half the bizygomatic distance.⁸

and

... there is a numerical relation of 3:1 between the bizygomatic breadth and the molar distance (measured between the centers of the first maxillary molar) ... [Orthodontic treatment should re-establish, but never disturb] this constitutionally determined relation.⁸

The ratio of width of the maxillary dental arch (maximum interbuccal distance at the deciduous second molars) to upper face width (bizygomatic diameter) was determined for each subject. As is customary, the resulting quotients were each multiplied by 100 to transpose them to percentages. Next, the ratios for subjects orthodontically rated "arch width normal" were separated from those placed in the category "arch width unsatisfactory." The ratios for subjects with normal maxillary arches then were arranged in two

ordered series, one representing the age of 5 years and the other the age of 7 years. Finally, the percentiles shown in Table I were chosen to characterize each distribution.

Selected findings from this table are as follows:

1. For the typical 5-year-old subject, maximum width of the maxillary dental arch is 42.7 per cent of upper face width. The index is lower, 41.9 per cent, for the typical subject aged 7 years.

2. One-half of the children 5 years of age have indices between 41.3 per cent and 44.2 per cent. At the age of 7 years, the central 50 per cent of the indices lie between 40.3 per cent and 43.5 per cent.

3. Taking both ages together, the smallest index is 37.7 per cent and the largest, 47.1 per cent. These figures yield a "normal" range of 9.4 (47.1 minus 37.7) for the age period 5 to 7 years.

TABLE I. RATIO OF MAXILLARY ARCH WIDTH TO UPPER FACE WIDTH IN ORTHODONTICALLY NORMAL CHILDREN

AGE (YR.)	N	MINIMUM	10	PERCENTILES:				MAXIMUM
				25	50	75	90	
5	70	39.0	40.5	41.3	42.7	44.2	45.2	47.1
7	56	37.7	39.5	40.3	41.9	43.5	44.6	46.5

Turning now to the dental arches classified "arch width unsatisfactory," we come to the clinically significant question of whether the indices in these instances are abnormally small (from those arches recommended for expansion) or abnormally large (from those recommended for contraction). Of the 12 subjects with unsatisfactory arches at the age of 5 years, the indices for 5 fall within the limits of the middle half of the series of normal indices, and the indices for all 12 fall within the normal range. At the age of 7 years, 4 of the 8 placed in the unsatisfactory group have indices which lie within the zone of the middle 50 per cent judged "normal," while 1 only has an index higher than the maximum for the normal series, i.e., a maxillary dental arch width 48.5 per cent of bizygomatic diameter. Obviously, these findings do not support the position, or hypothesis, that the ratio of arch width to face width is a useful aid in orthodontic practice.

Izard has published statements pertaining to results from "personal researches" on the ratio of "greatest maxillary width taken between the vestibular aspects of the teeth" and "greatest bizygomatic distance."⁸ The source materials were "numerous" human adult skulls "possessing normal arches" and a "not very numerous" series of children's skulls.⁸ Arch width was measured "between the external borders . . . of the second deciduous molars" in young specimens lacking eruption of the first permanent molars.⁸ For children with normal arches, it is stated that at all ages up to early adulthood the index "oscillates around 50" and individual variations "lie between 48 per cent and 52 per cent."⁸ In adulthood, individual variations are found to be "a little greater. . . . The index oscillates between 47 and 54 . . . [although] in 75 per

cent of the cases it varies only between 48.5 and 51.5."¹⁸ One-half of all the skulls examined are reported to have had a maximum dental arch width exactly 50 per cent of bizygomatic breadth.

The figures aligned in Table II show decisively that the low variability reported by Izard for the childhood years ("up to early adulthood") is not confirmed by the present study. Nor is Izard's low variability supported by the seriatim measurements on 28 children recently published by Woods.²⁰ Using lateral and frontal roentgenograms, in conjunction with a Wylie distortion compensator, Woods determined both the upper face width (taking as his landmark "the projection at the junction of the anterior root with the zygomatic process, which acts as an attachment for the temporomandibular ligament") and the maximum distance between the crowns of the maxillary first molars.²⁰ Ratios obtained from these measurements yield a range two and one-half times as large as the Izard range, i.e., from less than 42.5 per cent (Case 1937 at age 15 years and Case 1932 at age 16 years) to more than 52.5 per cent (Case 2005 at age 9 years).

TABLE II. COMPARISON OF THE VARIABILITY OF THE RATIO OF MAXILLARY ARCH WIDTH TO UPPER FACE WIDTH FROM TWO STUDIES ON ORTHODONTICALLY NORMAL CHILDREN

	INTERQUARTILE DISTANCE*	RANGE†
Present study:		
Age 5 years	2.9	8.1
Age 7 years	3.2	8.8
Izard:		
Up to early adulthood	0.0	4.0

*The zone within which the middle 50 per cent of the indices fall, i.e., seventy-fifth percentile minus twenty-fifth percentile.

†Maximum index minus minimum index.

Again, neither the present study nor Woods' study supports the age constancy claimed by Izard for the ratio of maxillary arch width to upper face width. Instead of the ratio remaining "constant during growth," it decreases with advancing age. The decrease found in the present study from the age of 5 years to the age of 7 years already has been noted and displayed (see Table I). Woods' study supplies evidence that this declining trend continues throughout the childhood years. Table III exhibits, at the ages of 8, 10, 12, and 14 years, both individual and group findings derived from Woods' data.

TABLE III. CHANGE WITH AGE IN THE RATIO OF MAXILLARY ARCH WIDTH TO UPPER FACE WIDTH (DERIVED FROM WOODS' DATA)

	AGE IN YEARS:			
	8	10	12	14
Ratios from means	49.4	48.6	47.5	46.7
Ratios for individuals:				
Case 2791 (male)	52.5	50.9	49.8	47.9
Case 2183 (female)	48.4	46.9	44.2	43.3

The group values express the means reported for maxillary arch width (at the permanent first molar) as percentages of the means for upper face width. Indices portraying the same individual at successive ages are shown for 1 boy (Case 2791) and 1 girl (Case 2183).

A somewhat different application of the ratio or index approach has been made by Berger.² This worker, "through the investigation of 30 adult persons with complete and normal denture" reports having discovered "that the distance of the first maxillary molars (measured between their centers) is one-third of the maximum zygomatic breadth."² A compendium of Berger's actual results follows: For 5 of the 30 subjects the ratio was exactly 1:3, for 19 or 63 per cent of the subjects arch width did not vary from one-third of face width more than 1.0 mm., while the only variations larger than 2.0 mm. were for 2 subjects for whom arch width exceeded one-third of face width by 2.7 mm. and 3.3 mm.

In advocating use of this 1:3 ratio as a basis for orthodontic decision regarding maxillary arch expansion, no alteration, or contraction, Berger takes cognizance of the fact that during the childhood years there are larger increases in face width than in arch width. A "correction for age" is made by adding to the bizygomatic diameter 1.5 mm. for each year of age under 20. To quote:

If we, for example, have to treat a child of ten years and would decide upon a right distance of the maxillary first molars, and the zygomatic breadth is 120 mm., we must not decide upon $120/3 = 40$ mm., but we have, first of all, to add the expected increase of the zygomatic breadth: 10 times 1.5 mm. It is only from this measure $120 + 15 = 135$ (expected zygomatic breadth), that we may derive the molar distance: $135/3 = 45$ mm.²

Berger's procedure was applied to data on 62 of the children in the present study. This group included all of the 5-year-old girls and 7-year-old boys who had been placed in the "normal arch" category. Having both interbuccal and interlingual measurements available for each subject, it was possible to derive bicentroid distance by taking one-half the sum of these measurements. The amounts added to bizygomatic diameter were 22.5 mm. at the age of 5 years and 19.5 mm. at the age of 7 years. Since arch width was measured by Berger between the permanent first molars and in the present study between the deciduous second molars, it is to be expected that the average ratio from the present study will be different than that from Berger, i.e., greater than 3:1. Specifically, one-third of corrected bizygomatic diameter is found to exceed bicentroid distance between the deciduous second molars by an average of 7.2 mm.

TABLE IV. VARIATION FROM THE AVERAGE RATIO OF MAXILLARY ARCH WIDTH TO UPPER FACE WIDTH (BERGER METHOD) FOR CHILDREN 5 TO 7 YEARS OF AGE

	AMOUNT OF DEVIATION (MM.):					
	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0	5.1-6.0
Number of subjects	24	15	12	7	3	1

This finding is of incidental interest only. Our central purpose in the application of Berger's method was not that of obtaining the average index but, rather, that of examining the similarity or dissimilarity of the indices for different individuals. Variations from the average (i.e., deviations from arch width equals one-third of corrected bizygomatic diameter minus 7.2 mm.) are displayed in Table IV. This table makes it clearly evident that the "close" relationship which Berger posits for maxillary arch width and upper face width

is not confirmed. Whereas Berger found 63 per cent of his 30 "normal denture" adults to cluster within 1.0 mm. of the average relation, only 39 per cent of these 62 "normal arch" children lie within this zone. Again, whereas only 7 per cent of Berger's sample differed more than 2.0 mm. from the average relation, 37 per cent of our sample differed from the average relation by amounts varying from 2.1 mm. to 5.9 mm.

Correlation Coefficient Approach.—An alternative method of studying the relationship between maxillary arch width and upper face width is that of computing the Pearson product-moment coefficient of correlation (r). Where the relationship between two measurements is perfect (e.g., in the event the subject with the smallest arch width is also the one with the smallest face width, the subject with the next larger arch width is also the one with the next larger face width, and so forth), $r = 1.00$. Where there is no relation whatever between two measurements (e.g., in the event different subjects with small arch widths have small, average, and large face widths; different subjects with average arch widths have small, average, and large face widths; and so forth), r is zero. It follows, then, that coefficients above $r = 0.90$ register a high relationship, while coefficients around $r = 0.20$ symbolize no more than a slight (clinically insignificant) association.

TABLE V. RELATIONSHIP BETWEEN MAXILLARY ARCH WIDTH AND UPPER FACE WIDTH IN ORTHODONTICALLY NORMAL CHILDREN

AGE (YR.)	MALES		FEMALES	
	N	r	N	r
5*	36	0.31	34	0.33
7	28	0.36	28	0.32

*The analyses at this age were made by Dr. Wayne L. Zeiger and included in his thesis for the M.S. degree.²¹

In terms of r , what is the amount or extent of association between bizygomatic diameter and maximum interbuccal width of the maxillary arch at the deciduous second molars? This was determined using the entire series of subjects classified as orthodontically satisfactory with reference to width of the maxillary arch. Separate coefficients were calculated for the following subgroups: 5-year-old males, 5-year-old females, 7-year-old males, 7-year-old females. Table V presents the results. It will be seen that the obtained r 's lie between 0.31 and 0.36. Prediction based upon coefficients of this order constitutes an improvement over "best guess" of less than 7 per cent; in other words, the relationship found is too low to be of practical value to the orthodontist in estimating a child's optimal arch width from his face width.

How do the coefficients of Table V compare with those reported by other workers? The correlation between upper face width and widths of the palate or maxillary dental arch has been studied by Bakwin and Bakwin,¹ Smyth and Young,¹⁵ Meyer,¹¹ Channing and Wissler,⁵ and Sullivan.¹⁶

Bakwin and Bakwin report a coefficient in infancy of $r = 0.50$ for bizygomatic diameter with maximum breadth of the palate. Their subjects were 100 newborn male infants of "Caucasian stock" drawn "from the vicinity of

Bellevue Hospital," New York City.¹ Palate breadth was measured on carefully prepared casts.

For 98 "healthy and vigorous" English children "varying in age from 2 to 5 years," Smyth and Young obtained a correlation of $r = 0.33$ between "maximum zygomatic breadth of face" and "maximum external breadth of the upper dental arch at the first deciduous molar."¹⁵ Coefficients also were secured on children 8 to 14 years of age "in whom the two dental arches exhibited what is generally regarded as the normal relationship," i.e., "morphologically normal occlusion."¹⁵ Here, bizygomatic diameter was studied in relation to two breadths of the maxillary arch "at the first permanent molar"—"maximum external breadth" and "minimum internal breadth."¹⁵ The r 's, after correction for wide age grouping, were between 0.26 and 0.48 (see Table VI). All of the arch widths in this investigation were obtained by direct measurement.

TABLE VI. CORRELATION COEFFICIENTS FOR UPPER FACE WIDTH (BIZYGOMATIC DIAMETER) WITH MAXILLARY ARCH WIDTH

	N	r	ARCH WIDTH AT:
Bakwin and Bakwin			
Newborn males	100	0.50	Maximum of palate
Smyth and Young			
Children 2-5 yr.	98	0.33	Deciduous first molars
Males 8-14 yr.	342	0.38	Permanent first molars,
Females 8-14 yr.	416	0.48	interbuccal
Males 8-14 yr.	219	0.26	Permanent first molars,
Females 8-14 yr.	175	0.38	interlingual
Meyer			
Children 4-17 yr.	95	0.18	Permanent first molars,
			interbuccal
Channing and Wissler			
Adult males	111	0.38	Permanent first molars,
			interlingual
Sullivan			
Kaffir skulls	36	0.53	Maximum of palate:
Eskimo skulls	47	0.40	adult males
Telenget skulls	43	0.31	
Berger			
Adults	30	0.88	Permanent first molars
Adults	30	0.50	Permanent first premolars
Present study			
Males 5 yr.	36	0.31	Deciduous second molars,
Females 5 yr.	34	0.33	interbuccal
Males 7 yr.	28	0.36	
Females 7 yr.	28	0.32	

A sample of Swiss children 4 to 17 years of age was found by Meyer to yield a correlation of $r = 0.18$ for bizygomatic diameter with width of the maxillary arch at the permanent first molars. The subjects were 95 children, largely over 11 years of age, with "anatomically correct occlusion."¹¹

A coefficient of $r = 0.36$ from 111 adult "white American" males is reported by Channing and Wissler.⁵ The measurements correlated are bizygomatic diameter and minimum dental cast distance between "the first molars . . . at the gum line." While the subjects were "feeble-minded individuals," Channing and Wissler showed that "the general type of the palate . . . is the same for feeble-minded as for normal individuals."

Sullivan, using 126 adult male skulls representing three racial groups, correlated maximum external breadth of the palate and maximum bizygomatic diameter. He reports r 's of 0.53, 0.40, and 0.31 on Kaffir, Eskimo, and Telenget skulls, respectively.

Finally, the previously discussed report of Berger² on "30 adult persons with complete and normal denture" afforded sufficient individual data to enable the writers to compute correlation coefficients for "maximum zygomatic breadth" in relation to bicentroid diameter between (a) "the first bicuspids" and (b) "the first molars."² The obtained r 's are 0.88 for upper face width with maxillary arch width at the first molar, and 0.50 for upper face width with maxillary arch width in the more anterior plane.

All of the coefficients referred to are assembled in Table VI. This table shows:

1. Seven of the 11 coefficients for the childhood years cluster between 0.30 and 0.40. Of the remaining 4, 2 are below 0.30 and the others are 0.48 and 0.50.
2. For adulthood, 5 of the 6 coefficients lie between 0.31 and 0.53. The exception is that from Berger's sample, where $r = 0.88$.
3. On the whole, there is a positive association between bizygomatic diameter and width of the maxillary alveolar or dental arch. The extent of association—as indicated by the 8 coefficients based upon samples of 95 subjects or more—appears not to exceed $r = 0.50$. Measurements which "vary together" only to this extent are not highly related.

RELATIONSHIP OF MAXILLARY ARCH WIDTH TO HEAD WIDTH

The association between width of the calvaria and width of the palate or maxillary dental arch has been studied by Bakwin and Bakwin,¹ Sullivan,¹⁶ and the writers. Bakwin and Bakwin, on the same group of 100 newborn male infants as previously described, obtained a correlation of $r = 0.55$ for "maximum palatal breadth" with "head breadth." Sullivan, employing comparable measurements on his series of adult male skulls, reports coefficients of zero for the 36 Kaffir specimens, 0.07 for the 47 Eskimo specimens, and 0.36 for the 43 Telenget specimens.

TABLE VII. ASSOCIATION BETWEEN MAXILLARY ARCH WIDTH AND HEAD WIDTH IN ORTHODONTICALLY NORMAL CHILDREN

AGE (YR.)	MALES		FEMALES	
	N	r	N	r
5*	36	0.26	34	0.11
7	28	0.19	28	-0.04

*The analyses at this age were made by Dr. Wayne L. Zeiger and included in his thesis for the M.S. degree.²¹

Table VII gives the findings of the present investigation on the association between biparietal diameter of the head and interbuccal diameter of the maxillary deciduous second molars. None of these coefficients is statistically significant: for the highest of the 4 coefficients ($r = 0.26$) t is 1.59.*

*For a discussion of this test of statistical significance, see Lindquist.³

The following generalization appears tenable. Notwithstanding the paucity of investigative work on the relationship between width of the calvaria and width of the maxillary arch, sufficient evidence is available to indicate that this relationship is too weak to be helpful in orthodontic diagnosis.

RELATIONSHIP OF MANDIBULAR ARCH WIDTH TO LOWER FACE WIDTH

The third and final problem considered was the extent to which a wide lower dental arch is associated with a wide lower face and a narrow lower dental arch with a narrow lower face. Data were available for investigating this at the age of 5 years from the present study and at the age of 9 years from Woods' study. In both instances the data included measurements of bigonial diameter and of mandibular arch width at two anteroposterior levels. For the present study, roentgenograms were utilized in obtaining bigonial diameter and dental casts in securing the minimum distance between the deciduous (a) cuspids and (b) second molars. Woods used roentgenograms solely, determining the bigonial diameter and "the widest point of the crowns" for the (a) "lower permanent canines" and (b) "lower permanent first molars."²⁰

Since the total number of subjects was small for 3 of the 4 series of paired measurements, analyses were made for the two sexes combined. The coefficients obtained are exhibited in Table VIII. None of these r 's exceeds 0.50, and one alone warrants the statistical inference (at the 1 per cent level of confidence) that there exists some positive association between width of the lower face and width of the mandibular dental arch.

TABLE VIII. ASSOCIATION BETWEEN MANDIBULAR ARCH WIDTH AND LOWER FACE WIDTH AT AGES 5 YEARS (PRESENT STUDY) AND 9 YEARS (FROM WOODS)

AGE (YR.)	BIGONIAL DIAMETER WITH:			
	INTERCUSPID DIAMETER		A MORE POSTERIOR DIAMETER*	
	N	r	N	r
5†	70	0.19	52‡	0.49
9	28	0.47	28	0.45

*Distance between the lingual surfaces of the deciduous second molars at the age of 5 years and distance between the permanent first molars at the age of 9 years.

†The analyses at this age were made by Dr. Thomas X. O'Reilly and included in his thesis for the M.S. degree.¹²

‡The smaller number of subjects here is due to exclusion of casts that were defective for a lingual surface of a deciduous second molar or had a missing deciduous second molar.

SUMMARY

This paper treats three problems: the relationship between maxillary arch width and width of the upper face, the relationship between maxillary arch width and width of the head, and the relationship between mandibular arch width and width of the lower face.

Original findings are reported on a sample of North American white children residing in or near Iowa City, Iowa. These findings are integrated with relevant materials from numerous investigations in the dental and anthropologic literature. Of the three relationships brought under study, the composite information is most substantial for maxillary arch width with upper face width.

No strong association is found between transverse dimensions of the head or face and widths of the dental arches. It is concluded that none of the relations studied is particularly useful to the clinician in orthodontic diagnosis and treatment.

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PSYCHOSOMATIC EVALUATION OF THE ORTHODONTIC PATIENT

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ORTHODONTIC treatment in its early days, although complicated in its appliance therapy, remained relatively uncomplicated in its approach, relatively uncontaminated by biologic and scientific factors, and relatively unsuccessful. The emphasis was mechanistic, and early orthodontic literature mirrored this emphasis by consisting, for the most part, of descriptions of appliances and instructions concerning their use.

Today, appliance therapy is still the keystone of orthodontic success, but it is being conditioned by other, less mechanical, factors. There is a shifting emphasis among orthodontists from description toward interpretation and evaluation. The findings of scientists in the fields of radiography, nutrition, pediatrics, physiology, psychology, and metallurgy, among others, have been applied to orthodontics, and as a result the specialty has become more complicated but more successful.

Among the problems now facing the orthodontist and other medical and dental practitioners is that of psychosomatics or psychodynamics, the problem of the physical manifestations of emotional disturbances. The stresses and tensions of adolescence, the psychic trauma brought on by the conspicuous physical aberration which is usually the major complaint of the orthodontic patient, and the significance attached to the oral cavity in psychiatric and psychoanalytic procedures indicate why an orthodontic patient may be particularly vulnerable to emotional upsets. Therefore, it is not surprising that problems related to the field of psychosomatic medicine often plague the orthodontist.

Subsequent to the publication of a previous paper,¹ I received varying comments from orthodontists. There were those who decried any theories relating psychosomatic considerations to orthodontics as far-fetched, impractical, and untenable. For the most part, however, orthodontists expressed a body of opinion revealing the existence of problems of a psychogenic or psychosomatic nature within their own practices, and many related cases to the point. Two such cases, which are typical, are presented here.

CASE REPORTS

CASE 1.—The patient was a girl, 11 years, 10 months of age. She was a pretty girl, well developed physically and well oriented. She was an only child who had sucked her thumb until the age of 10 years and was also a nail-biter. Although restless in the dental chair, she was cooperative and a good patient so far as tolerating painful and uncomfortable intraoral procedures.

Her orthodontic problem was not extreme. She presented with a Class I malocclusion typified by good interdigitation of the right and left buccal seg-

ments, with spacing and protrusion of the maxillary anterior teeth and mild rotations of the premolars. The prognosis for successful orthodontic treatment was excellent.

Upper and lower lingual arches were inserted, followed by an upper labial arch. Within the space of a month and a half two of these appliances had been broken, and two molar bands had required recementation. Her attitude had changed to one of noncooperation, and the orthodontist felt it advisable to remove all bands and appliances and to insert an upper removable bite plate to be worn during the summer vacation.

At the end of the summer the patient returned with the bite plate completely destroyed. "My dog chewed it up," was her explanation.

The orthodontist, attempting to determine the cause of this constant breakage, found it in the home life of the child. At the time that orthodontic treatment was instituted her parents had been bringing their personal incompatibilities to a head and had been on the verge of separation. Moreover, they had told the child that the cost of orthodontic treatment would preclude the possibility of her going to camp for the summer.

Emotional anxieties generated by the constant dissension at home and a resentment toward orthodontic treatment because it was going to spoil her vacation provoked oral responses and manipulations causing the broken appliances.

The story has a happy ending, orthodontically at least. At the last moment the girl was sent to camp, and during the summer her parents were separated. At the end of the summer, new appliances were placed in her mouth, and treatment since then has progressed toward a successful conclusion. (Reported by Dr. L. Kresky, Brooklyn, New York.)

CASE 2.—The patient was a girl, 8½ years of age. She presented with a history of chronic and continued thumb-sucking and of bed-wetting which had terminated in the recent past but had been replaced by nail-biting. Her parents were separated, and she attended and lived at a private school. She had an exceptionally high I.Q.

Her orthodontic problem was that of a Class I relationship of the buccal segments with protrusion of the upper anterior teeth. An upper lingual arch, with spurs to discourage thumb-sucking, and an upper labial arch were inserted. Within three and one-half months there had been three breakages or distortions of the arches. Consultation between the orthodontist and the school superintendent led to the belief that the breakage was deliberate and was an expression of the resentment of the girl against her house mother at the school. This belief was substantiated by the fact that her behavior was greatly improved while at home with her mother during the summer vacation.

At the end of four and one-half months it was decided to discontinue treatment. The anterior protrusion had been reduced, but the mouth still required orthodontic treatment. No retaining appliances were used, because it was deemed certain that the patient would not tolerate them in her mouth. (Reported by Dr. R. Cole, Tarrytown, New York.)

The results in these cases are in accordance with a recent report by Stolzenberg² showing that psychic and emotional stimuli can prolong the period of orthodontic treatment and are responsible for many nonproductive hours devoted to repairing appliances, recementing bands, and postponed and broken appointments.

Reports of this type, multiplied manifold, indicate that to many orthodontists physical phenomena caused by emotional factors form a real and present problem. Such a problem may be approached by some as being insoluble within the confines of the orthodontic office and therefore not worthy of the orthodontist's consideration. To others it is a problem that must be faced and either overcome or minimized, with or without medical and psychosomatic aid, if orthodontic treatment is to be successful.

Granting at least partial truth to the premise that emotional factors can influence orthodontic treatment, it would appear logical that these factors should be recognized and evaluated before treatment is instituted. With this in mind a procedure for such an evaluation based upon information which is readily available to the orthodontist has been prepared and utilized effectively. It is submitted for consideration with the caution that it is not intended to serve as an "emotional check list" nor as a formula calculated to yield an "emotional quotient" for the patient. However, it may function as a guide in questioning and observation and as an incomplete listing of points that may be covered, and as such it is presented here.

OUTLINE FOR PSYCHOSOMATIC EVALUATION

1. Consciousness of esthetic defect:
 - a. Compensatory masking actions.
 - b. Verbalized expressions by patient and parent.
2. Habitual motor activity:
 - a. Directly affecting oral structures.
 - b. Not directly affecting oral structures.
3. Involuntary behavior disorders:
 - a. Stuttering and stammering.
 - b. Sleep disorders.
 - c. Vomiting.
4. Social attitudes:
 - a. Toward parents.
 - b. Toward other children.
 - c. Toward adults.
 - d. Toward orthodontist.
 - e. Recreational activities and special interests.
5. Scholastic status:
 - a. Progress and grades in school.
 - b. Attendance.
 - c. I.Q.

DISCUSSION

1. *Consciousness of Esthetic Defect.*—This is considered to be of prime importance because it is so often the source of the emotional difficulty and the cause of its perpetuation. It may be manifested by the presence of compensatory masking actions, such as covering the mouth with the hands or handkerchief, obvious reluctance to smile, or averting the face as much as possible. Very often the patient will be quite frank in expressing concern, or the parents may reveal instances of the unwitting cruelty of other children, expressed in such terms as "Mortimer Snerd" and "buck tooth."

Psychiatrists attach more than passing significance to obvious physical defects in children. Hall³ expressed it as follows: "If a child has red hair, a snub nose, a squint, prominent teeth or ears, or a head of unusual shape, he may become the butt of others and develop symptoms of emotional upset. It is characteristic of the young as a whole that they show little mercy toward the oddity, the weakling, the underdog. . . . Children with physical defects are repeatedly met in psychiatric practice. Any blemish, peculiarity, or deformity should be carefully noted."

2. *Habitual Motor Activity.*—Such activity is referred to by psychiatrists as ties or habit spasms which consist of repeated involuntary muscular movements. They afford a child a motor release of accumulated emotional strain. It is generally agreed that "no happy, secure child ever develops ties. . . . There is always a correlation between the intensity of the movements and the severity of the emotional strain."⁴

Ties have been classified into groupings by Olson,⁵ and the first of these categories is the oral. These are of particular interest to the orthodontist because they consist of habits which have a direct effect upon oral structures. This group includes thumb- and finger-sucking, nail-biting, and tongue-thrusting. Other groupings are the nasal (picking, scratching, or wrinkling the nose), hirsutal (pulling or twisting hair, scratching head), irritational, (scratching body), manual (picking fingers, writhing hands, clenching fists), ocular (rubbing eyes, blinking, winking), aural (pulling, picking ear), genital (manipulating genitalia, rubbing thighs), and facial (grimacing, twitching muscles).

In addition to these specific habit spasms there are the generalized motor states which may be observed, namely, the conditions of hyperkinesia and hypokinesia. The hyperkinetic child is the lean, underweight, fidgety child who is always on the go. The hypokinetic child, by contrast, is habitually unusually quiet and inactive and is further characterized by laziness, indifference, unwillingness for exertion, and failure to make the most of his capabilities. Each extreme may be attended by emotional difficulties and is therefore noteworthy in evaluation.

3. *Involuntary Behavior Disorders.*—Whereas ties and habit spasms can be evaluated only as part of an over-all, polysymptomatic picture, behavior patterns are more meaningful and, even when considered as individual symptoms, are reliable evidence of an emotional disturbance. Investigators agree

that there is always an emotional basis for stammering and stuttering, which are disturbances of speech rhythm and are often accompanied by movements which resemble ties except that they are voluntary and are used as an aid in emitting the sounds. "All authorities agree that as a stammerer approaches adolescence, he becomes greatly disturbed about his handicap and develops serious personality disorders."⁶

Disorders of sleep are often the first signs of disturbed emotional states, especially in children. These disorders vary from the generalized restless sleep of the hyperkinetic child to specific entities, such as sleep-walking and sleep-talking, nightmares and night terrors, or may even be so mild a condition as a bruxism.

Vomiting, in children, has a variety of causes, most of which are not an emotional basis. However, repeated vomiting in times of juvenile stress, such as before taking a school examination, and the vomiting exhibited in car sickness can be generally assumed to be evidence of a disturbed emotional state.

Enuresis and masturbation are other behavior disorders which have an emotional cause and which are also productive of emotional results. However, it is considered inadvisable for the orthodontists to include these in his line of inquiry because of the obvious personal difficulties involved.

4. *Social Attitudes.*—Adolescence has been characterized as "the change from an excessive emotionalized interest in social relationships to a stable, more objective adult level. With the oncoming of adolescence, the boy or girl becomes acutely aware of social relationships or pressures."⁷ It follows, therefore, that a study of the social relationships of adolescents will often yield a clue to their emotional states. Such a study requires a training and skill that is ordinarily beyond that of the orthodontist. However, observation and judicious questioning can provide the orthodontist with valuable information concerning the social attitudes and interests of the patient which can be evaluated in terms of resulting emotional states.

The Institute of Child Welfare at the University of California has formulated a scale for measuring socialization in which are included attractiveness of appearance, grooming activity, interest in the opposite sex, interest in social contacts, seeking of adult company, compliance with authority, social self-confidence, self-assertion, sensitivity, dependence on approval, affection, popularity, and leadership as personal characteristics to be used as criteria for evaluation.⁷

5. *Scholastic Status.*—A five-minute telephone conversation with the teacher or principal of the patient's school can be the source of much information concerning the mental abilities of the child as well as affording an independent and unprejudiced personality appraisal. The scholastically backward child, the precocious child, the child whose deportment is a constant problem all represent extremes the orthodontist should take into consideration. Poor attendance at school is generally a harbinger of a similar laxity where orthodontic appointments are concerned.

"Judicious questioning and observation" have been listed as the sources of much of this information, but to these must be added "common sense." The child and parent must be made to feel that the orthodontist is interested in the patient, not in his peculiarities. Certain questions and phrases carry opprobrious connotations, and these must be avoided. A parent who might take offense when asked, "Is your child nervous?" will find nothing objectionable in the question, "Do you think Jane is a sensitive child?" By the same token, children will resent what they consider prying into their social habits unless the questioning becomes a matter of general conversation and friendliness. By utilizing the proper methods, with an assist from the teacher and the physician, the orthodontist can provide himself with information which, although it will not dictate treatment, will condition it by forming the basis of an approach to the child who presents characteristics of emotional disturbances.

To illustrate that such an approach can be of value, the following cases are cited. They also high light the paradox that children who are most concerned with hiding the appearance of unsightly anterior teeth are very often those who object most strenuously to wearing the bands and appliances which would serve to eliminate the source of their discontent.

CASE REPORTS

CASE 3.—The patient was a girl, 12 years of age. She was unusually quiet in the dental chair, and inquiry revealed this was her usual manner with adults, but that she was popular and active with children her own age. Her mother was a forceful and dominating person, and her older sister had a brilliant scholastic record which far outshone that of the patient, who was an average student with an I.Q. of 110. She had sucked her thumb until the age of 10½ years and also presented with a tongue-thrusting habit.

She appeared noncommunicative and even resentful at the first visits, and the mother volunteered the information that she had been practically dragged to the office and did not want to have her teeth straightened, even though she obviously manipulated her lips to provide a constant mask for her teeth. Her mother's attitude was that the child had to undergo treatment whether she wanted to or not, and the patient reluctantly agreed to it.

Her malocclusion was a Class II, Division 1 type of case, complicated by the tongue-thrusting habit which had opened spaces in the mandibular and maxillary arches. Appliance therapy included an upper twin wire appliance with bands on four upper anterior teeth and a lower full banded appliance. Three of the first five appointments produced cancellations, because the mother could not locate the patient to bring her to the office.

After the appliances had finally been inserted, similar difficulties were constantly arising. After five months of treatment there had been four disappointments or cancellations and two emergency appointments to replace loosened appliances. Progress was slow, and the patient continued to resent the orthodontist and the treatment. Consultation with the mother revealed that the child had been given the impression that only four teeth were to be banded,

and there she was with a band on practically every tooth. In reality she had been informed that only four bands would be easily visible, namely those on the upper anterior teeth. At any rate the misunderstanding had given her a focal point for her continued resentment, and what should have been a routine case had been complicated to an unfortunate extent by emotional considerations which may have been avoided by a more accurate appraisal at the outset.

At the present time, seventeen months after the initiation of treatment, the patient is more or less reconciled to having to see it through, and progress is more favorable but still slow. Disappointments and cancellations are numerous, and, in the absence of other demonstrable causes, the orthodontist is disposed to blame emotional disturbances for the unsatisfactory situation.

CASE 4.—The patient was a girl, an only child, 15 years of age. She was large for her age, overweight (attributed to laziness and lack of activity), and extremely immature, even babyish, dressing like a child of 9 or 10. She had just completed her ninth grade at school, had an I.Q. of 120, and possessed unusual artistic talents, but was characterized by her teacher as "disinterested and listless." She had no friends her own age, and her mother was her constant companion. Her medical history revealed that she was receiving thyroid extract because of a low basal metabolism with the additional hope that it might overcome her listlessness.

Her malocclusion was a Class II, Division 1 type with a satisfactory profile, but very irregular upper anterior teeth which she attempted to cover by frequently holding a handkerchief to her mouth. The buccal segments of the mandibular arch were collapsed, due in part to a severe habit of leaning the side of her face on her fists, especially when in school.

She was extremely conscious of her esthetic deficiency, and three times during her initial visit repeated the question, "Will the braces show?"

Treatment was instituted with "braces that did not show," upper and lower lingual arches with spring action to expand the buccal segments. After four months, during which period a special attempt was made to cultivate friendliness, she was quite amenable to having bands placed on her upper anterior teeth and a twin wire appliance inserted. Treatment has progressed satisfactorily since then and is nearing completion at the end of fifteen months. Although she presented with evidences of emotional disturbance, these have in no instance complicated treatment.

CONCLUSIONS

That medical and dental treatment and symptoms can be affected by psychosomatic considerations is now a generally accepted principle. That orthodontic treatment can be similarly complicated is becoming increasingly apparent. Just as the orthodontist makes an effort to appraise other factors which might complicate treatment, so too should he attempt to evaluate and compensate for emotional disturbances evidenced by his patients.

For this purpose an outline for the psychosomatic evaluation of the orthodontic patient has been presented with the caution that it is meant only to indi-

cate the direction investigation should take, rather than being a listing of specific symptoms to be covered. An added caution is that the evaluation must be on a quantitative, polysymptomatic rather than a qualitative basis, because "such evidence as is available on the distribution of conduct disorders, on emotional stability, on honesty, on nervous habits indicates that these are the problems of every child."⁸ It is the intensity and frequency of symptoms, rather than their mere presence, that is significant.

This paper is liberally sprinkled with terms such as "psychosomatic," "psychogenic," and "emotional disturbances," so much so as to distort the perspective. However, although cases have been presented with intent to emphasize the emotional aspects, the purpose here is not to make an excessive claim nor to build up an exaggerated case for the psychosomatic approach. Rather it is intended that the psychosomatic problem should be viewed in its proper light as one facet of the complicated picture of modern orthodontics.

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Editorial

Dr. Joseph D. Eby Honored

THE Northeastern Society of Orthodontists, at its fall meeting held in Washington, D. C., presented a scroll to Dr. Joseph D. Eby at a luncheon held in his honor on Tuesday, Nov. 7, 1950. The luncheon was tendered Dr. Eby as President of the American Board of Orthodontics, and in recognition of his many years of service to this Society and to the specialty of orthodontics in general.

Seated on the dais were representatives of the Armed Services with whom Dr. Eby had seen active service and been identified throughout his professional career; the American Association of Orthodontists, the American Board of Orthodontics, and the Northeastern Society of Orthodontists. Those on the dais included Dr. Richard A. Lowy, President of the Northeastern Society of Orthodontists, Major General Walter Love, Chief of the Dental Corps, United States Army; Brigadier General Oscar P. Snyder, Director of Dental Training and Research Activities, Army Medical Center, Washington, D. C.; Dr. Leigh C. Fairbank, Brigadier General, retired, United States Army, former Chief of the Army Dental Corps; Dr. Joseph E. Johnson, President of the American Association of Orthodontists; Dr. John V. Mershon, lifelong friend and preceptor of Dr. Eby; Dr. Leuman M. Waugh who presented a eulogy to the guest of honor; Dr. Raymond L. Webster and Dr. Stephen C. Hopkins, members of the American Board of Orthodontics; Dr. George S. Callaway, Director of the Northeastern Society of Orthodontists; Dr. Paul Hoffman, President-Elect of the Northeastern Society of Orthodontists; Dr. H. Trendley Dean, Director of Dental Health Institutes of the National Institutes of Health, Bethesda, Md.; and Dr. J. A. Salzmann, toastmaster.

Dr. Salzmann in opening the luncheon program read a list of the names of friends of Dr. Eby throughout the United States and Canada who sent congratulatory telegrams and letters. He then introduced Major General Walter Love who paid great tribute to Dr. Eby. He recalled that he had first met Dr. Eby at Camp Greenleaf in Georgia in 1918, during World War I, where Dr. Eby was General Love's instructor in maxillofacial surgery. General Love referred to Dr. Eby's outstanding service at Walter Reed General Hospital in Washington in maxillofacial reconstruction during 1919-1922.

Brigadier General Oscar P. Snyder told of his friendship with Dr. Eby dating back to 1917, and of Dr. Eby's subsequent years of invaluable service to the Armed Forces.

Dr. Leigh C. Fairbank, Brigadier General, retired, United States Army, former Chief of the Army Dental Corps, gave an account of Dr. Eby's cooperation in dental matters during World War II.

Dr. Leuman M. Waugh eulogized the guest of honor. Dr. Waugh traced Dr. Eby's youth, his association with Dr. Thomas P. Hinman, of Atlanta, Ga., the various associations in orthodontics which Dr. Eby experienced, including

training with Dr. Calvin S. Case, Dr. Victor Hugo Jackson, and Dr. Eby's service during World War I, in which he entered active duty in September, 1917, as a First Lieutenant in the Dental Reserve Corps. He was the first Dental Reserve officer to be elevated to the grade of Major (February, 1918), and retired from active duty in 1922 with the grade of Lieutenant Colonel. Resuming his interest in orthodontics, he had the cooperative interest and friendship of Dr. John V. Mershon and Dr. Martin Dewey.

In recounting Dr. Eby's professional activities and especially in orthodontics, Dr. Waugh mentioned some of them as follows:

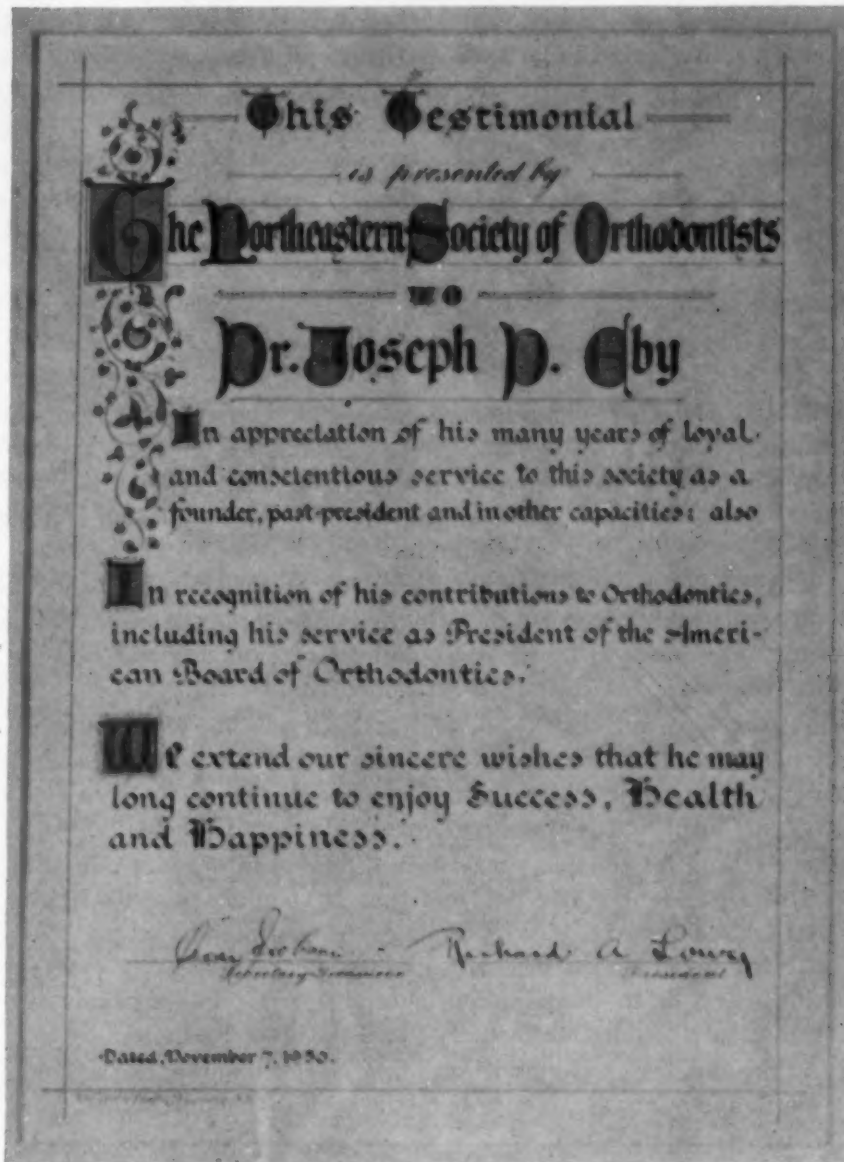
He is a Founder, and a Past-President of the Northeastern Society of Orthodontists; a Past-President of the American Association of Orthodontists and a Past-President of the New York Academy of Dentistry. Dr. Eby has been Associate Editor of the AMERICAN JOURNAL OF ORTHODONTICS since 1919 and has taken a leading part in its wonderful service to the profession. Since 1941 Dr. Eby has served as a Director of the American Board of Orthodontics. In addition, he has been a member of the Advisory Committee on Orthodontics of the Department of Health of the City of New York and the Department of Health of the State of New York.

Dr. Richard A. Lowy, President of the Society, then presented a scroll to Dr. Eby in behalf of the Northeastern Society of Orthodontists. In accepting the scroll, Dr. Eby expressed his appreciation of the honor that the Northeastern Society of Orthodontists had bestowed upon him. He acknowledged the great influence in shaping his career which was exerted by many of the outstanding orthodontists and military personnel present. Among these were Major General Walter Love, Dr. Robert H. Ivy, Brigadier General O. P. Snyder, Dr. Leigh C. Fairbank, Dr. John V. Mershon, Dr. Joseph E. Johnson, and the many other friends he has among the profession.

In recounting his experience with the American Board of Orthodontics, Dr. Eby pointed out that twenty presidents of the American Board of Orthodontics have preceded him and that these were men who were all outstanding in the performance of their duties and deserving of the highest honors. He stated that 329 members of the American Association of Orthodontists had been certified by the Board since its inception. The following information relating to the American Board of Orthodontics was presented by Dr. Eby:

"The American Board of Orthodontics is the third oldest certifying board of some eighteen-odd certifying boards in medicine and dentistry. The average age of our applicants is going down, and I think we can say the quality of the work is going up. This does not imply, however, that the older men are not readily passed, and with more credits on the basis of experience. It seems to me that every person embracing orthodontics as a career should nurture the ideal of becoming certified by his Board. I still say you can rest assured that it is within your grasp because the policy of the Board is to wish to certify everyone. Of course, we have to use the proper judgment to keep the standard and level high, but you don't have to feel that it is in any sense prohibitive if you have an ambition in that direction."

One of the high lights of the Board during the past year was its approval by the Council on Dental Education of the American Dental Association, which was unanimously ratified by their Board of Trustees and House of Delegates.



In concluding his remarks, Dr. Eby stated:

"Genius is rarely born; it is talent plus nine-tenths hard work. Orthodontics is not only a practical science and profession; it is creative art in a sense. It may be compared to sculpture as we help to mold mouths and faces. It is precision work, so we may compare ourselves with engineers. It is a field with so many angles and prisms as to make it constantly inspiring to the person who has chosen it for his life's work. It is exciting if we think of it in this way,

certainly never dull to those who truly love their work. If your capital investment in life is doing things for others, the dividend is friendship. Our great Creator has given us a myriad of facial patterns with which to work. We cannot, and will not betray that trust. So the greatest of all is friendship. If I could be assured that all of you friends would be right back here waiting for me, just as you are, I would be glad to go back and start all over again. Long shall we all journey together in this spirit and with a song in our hearts. And so, dear friends, let me thank you from the bottom of my heart."

—J. A. S.

American Board of Orthodontics

NOTWITHSTANDING the American Board of Orthodontics was the first accrediting board to be created in the profession of dentistry, and the third board of that kind to be created in any department of health service, it is only recently that this board has been approved by the Council on Dental Education of the American Dental Association.

Just why this certifying board, with all its background and prestige, has not been previously approved by the American Dental Association Council has been difficult to understand by the rank and file of orthodontists who are members of the American Association of Orthodontists.

Probably one reason this approval has been so long delayed is that the American Board of Orthodontics did not see eye to eye with those who believed that fixed standard requirements should be made for all of the specialty boards in dentistry, orthodontics, oral surgery, prosthetics, and others.

Another reason for the delay may have been due to the fact that the American Board of Orthodontics did not feel that it should assert itself vigorously in prescribing various and sundry courses in dental education. The Board obviously did not feel that a prescribed course of graduate study of arbitrary length and content, or the possession of special degrees, was a mandatory qualification or that such stipulations exactly fitted the orthodontic picture.

Education and training notwithstanding, you cannot play the piano without long hours and years of practice—so it is with orthodontics. All were aware of that phase of the situation.

After several years of ineffective negotiations since 1947, Drs. Blayney and Peterson of the Council on Dental Education met with the Board in Chicago, May, 1950, and there established the relations which later led to such successful conclusions.

Much credit must go to Board members, President Joseph D. Eby, Vice-President Stephen C. Hopkins, Director Leuman M. Waugh, Past-President Bernard G. DeVries, and others, because they worked hard and long to accomplish this purpose and never lost track of the goal.

It is understood that the American Board of Orthodontics retained the five-year exclusive practice clause as a requirement, and that there is retained an available substitute for the two years of academic study in the form of preceptorships, teaching in colleges, and service in clinics or institutions (provided the chief of the orthodontic divisions is a diplomat fully accredited by the Board).

Now that this Board has the official blessing of the American Dental Association, it is in a better position to make its influence felt for the advance of orthodontics as a specialty. Now it will be the official American Board of Orthodontics which is to say what requirement will have to be satisfied before an orthodontist may become certified by the Specialty Board and accepted by the American Dental Association.

This is a great step in advance, and no doubt will do much to level off the wide variations of opinion as to indoctrination in orthodontic study and practice. The important thing in the future will be to be certified by the American Board of Orthodontics. That will mean about the same thing as it does in the profession of accountancy. The public have been led to understand that an accountant is either a C.P.A. or a P.A. (without the "C") and so listed in official lists.

The discussion leading up to the accreditation of the American Board of Orthodontics consumed a period over several years, and now the points made, plus the policies adopted by the American Board of Orthodontics, are interesting to view in retrospect.

Here are a few of the official policies outlined to the Committee of the American Dental Association by the American Board of Orthodontics in making application for approval.

The American Board of Orthodontics is composed of individuals having no connection whatsoever with dental schools, and that means there can be no prejudice, educational intolerance, whims, or caprice. The American Board of Orthodontics entertains no prejudice as to whether or not the candidate holds one or more graduate degrees from a university, or whether or not he has experienced so-called "short courses." The Board is interested in the competency and knowledge of the candidate as of the date of his examination, and whether or not they believe him to be a good orthodontist and a first-class citizen.

Experience has shown the Board that clinical experience throughout a period of five years is necessary to prepare a candidate for certification. "It has not been the Board's experience that those who hold graduate degrees have invariably proved themselves more worthy of certification than others. In other words, the possession of an impressive number of degrees does not necessarily mean that the holder is a competent, practicing orthodontist. If men with five years of actual clinical experience, but who do not have two years of formal orthodontic education, should take the examination for certification and are found to be poor practitioners, they have the right to be re-examined, provided the applicant will seek study. To make such study mandatory, however, centralizes the authority to establish qualifications in a fashion which may be adverse to the development of many fine specialists in an enlarging field of orthodontic

service." The Board feels that it should preserve the right of an individual to apply for certification without having to wait or defer to the slow processes of establishing curricular changes and the provision of adequate educational facilities.

One thing is certain—the American Board of Orthodontics is certain to require membership in the American Association of Orothodontists as a requirement for certification by the American Board of Orthodontics.

Educational facilities are always in a state of shifting change, and just because a graduate school is connected with a university does not necessarily imply that the teaching is what is expected by the Council, or the Board.

No doubt the accreditation marks a great step in advance for the specialty of orthodontics, as well as Orthodontic training.

H. C. P.

Reports

REPORT OF THE EDUCATIONAL COMMITTEE OF THE SOUTHERN SOCIETY OF ORTHODONTISTS

IN PREPARING this report the committee contacted the various dental schools in the Southeast, the chairman of the Educational Committee for the American Association of Orthodontists, the secretary of the American Association of Orthodontists, and the chairman of the Orthodontic Educational Committee for the American Association of Dental Schools, seeking information concerning orthodontic instruction. The following findings were made:

Undergraduate Work.—The five fully operating southeastern schools of dentistry offer varying undergraduate courses in orthodontics, beginning with the sophomore year with lectures and technical work and continuing through the junior and senior years with lectures, clinical observation, and orthodontic treatment. One school requires the undergraduate student to treat at least one patient during the junior and senior years but does not require him to complete treatment. There are varying amounts of time spent in the different schools with this work; however, approximately one and one-half to two hours per week seems to be the average amount of time of instruction.

One of the orthodontic department heads expressed so ably the feeling of the committee as to what it considers should constitute the objectives and purpose of orthodontic undergraduate training. The statement follows:

“Objectives: To give the student an appreciation of the problems of orthodontics, to recognize developing malocclusion and intelligently discuss it with a patient, to recognize his limitations as a general practitioner of dentistry, but also to render orthodontic service within the scope of his ability if a specialist is not available in his community.

“This course is not intended to prepare a student for specialization, but to give him a good foundation for further study if he so desires.”

Graduate Work.—There are two schools in the Southeast, Emory University and the University of Tennessee, offering postgraduate instruction. Both of these are on a working fellowship basis where the graduate students are used as part-time instructors in other departments of dentistry. The amount of time seems to vary, but runs somewhere in the neighborhood of 1,300 hours for the two-year course. These are instructed by faculty members in each instance. The University of Tennessee is in a position to accept from eight to ten students; however, Emory University did not state the number it could accommodate.

The newly organized Dental Schools at the University of Alabama (now in its second year) and the University of North Carolina (now in its first year) plan to offer graduate work when the schools are far enough advanced in their curriculum.

Attached is a list of the dental schools throughout the United States which offer graduate work, with the amount of time required, and indicating whether or not a degree or a certificate of proficiency in orthodontics is awarded. It is

the opinion of the faculties of these schools that the graduates are in a position to go into the exclusive practice of orthodontics. In all cases they are advised to continue to study and to attend refresher courses of instruction which will help them to become more proficient orthodontists. They are also urged to affiliate themselves with the various orthodontic societies.

Short-Term Courses.—We are all familiar with the short-term courses offered by several of the universities, in which a graduate orthodontist may receive instruction in the basic sciences of orthodontics, appliance therapy, or a combination of both. These courses, in some instances, are conducted by the faculty members, whereas in other cases men outstanding in a particular type of appliance are brought in for lectures and instruction in the advanced use of a specified type of appliance. These courses usually extend over a period of ten days to two weeks.

Seminars.—Various groups in certain parts of the country at given intervals hold seminars to which they will invite outstanding clinicians for the purpose of conducting lectures and offering instruction in the use of the appliance with which he or they are most familiar. They vary in time from several days to two weeks.

In the communication from Dr. Allan G. Brodie, present chairman of the A. A. O. Educational Committee, he writes in part:

“Two years ago at the meeting in Chicago of the A. A. D. S. a report was made by Dr. George Moore on the present teaching in colleges. This was preceded by a historical résumé of the whole development of such efforts. To date neither of these has been published.

As an outgrowth of the above-mentioned meeting a program was established last spring and was given at French Lick Springs. This was designed to indicate the type of material the inclusion of which we favored and consisted of the presentation of five lectures by various teachers of orthodontics in several schools. Although the program was well received, no action was taken and the entire matter will be summed up in a report to be given before the schools' association in March.”

Your committee borrowed a copy of the above-mentioned report from the present chairman of the A. A. D. S., Dr. Samuel Hemley (orthodontist). This was reviewed and though there is much information in which we are sure you would be interested, it was deemed inadvisable to make comment at this time. The reason for withholding comment is that the report is now being revised and will be presented with recommendations at the meeting of the A. A. D. S. in March, 1951. Therefore, we suggest that next year's Educational Committee of the S. S. O. secure a copy of the revised report and recommendations and advise this group of its findings.

Respectfully submitted,

PAUL HOFFMAN,

H. K. TERRY,

OLIN W. OWEN, Chairman.

GRADUATE COURSES IN ORTHODONTICS OFFERED BY THE ACCREDITED DENTAL
SCHOOLS OF THE UNITED STATES, 1949-1950

University of California	15 months	Certificate
University of So. California	14 months	M.S.
Howard University	385 hours	
Emory University	2 years	Certificate*
Northwestern	15 months	M.S.D.
University of Illinois	18 months	M.S.
University of Indiana	18 months	M.S.
University of Iowa	Requirements and certification not clear	
Tufts College	18 months	M.S.
University of Michigan	2 years†	M.S.
University of Minnesota	18 months	M.S.D.
St. Louis University	2 years†	M.S.
University of Kansas City	14 months	M.S.D.
Washington University	21 months	M.S.
Ohio State University	2 years†	M.S.
Western Reserve University	36 sem. hours	M.S.
University of Pennsylvania	12 months	Certificate
University of Pittsburgh	1 year	M.S.
University of Tennessee	18 months (half time)	Certificate
University of Washington	5 quarters	M.S.

*To a teaching fellow.

†2 academic years with summer session between (actually 21 months).

REPORT OF THE PUBLIC RELATIONS COMMITTEE OF THE
SOUTHERN SOCIETY OF ORTHODONTISTS

THIS Committee can function only through the actions of each and every member of the Society.

First we must improve relations among ourselves, then with the dentists and physicians. Better public relations will naturally follow.

I wish to refer you to a thesis on professional ethics read at the American Association Meeting in Chicago by Dr. W. R. Alstadt of Little Rock, Ark., and published in the June, 1950, issue of our JOURNAL.

This thesis is so directly to the point that I should like to quote its summary:

"In summarizing, let me present briefly some very important factors for all of us to consider:

"1. Cooperate willingly with other orthodontists, general practitioners of dentistry, physicians, and surgeons for the utmost welfare of the patient.

"2. Conduct ourselves both privately and publicly on a high plane.

"3. Review our code of ethics periodically.

"4. Do not make careless remarks.

"5. Treat all patients under all circumstances as you would wish to be treated.

"6. Refrain from unjust criticism of appliances, technique, and methods of treatment.

"7. Extend all possible courtesy to temporary patients, making no charge for one visit. If the patient is to be with you several weeks or months, then it is permissible to charge for services.

"8. In accepting transfer patients and it is necessary to change appliances, do so gradually and tactfully with no charge for changing the appliances. Keep the same financial arrangements as the previous orthodontist whenever possible. Above all else do not criticize the previous orthodontist.

"9. In transferring patients to another orthodontist, do not attempt to force your diagnosis; do not attempt to determine fees; send adequate case records; consult the orthodontic directory and assist the parents in selecting a new orthodontist.

"10. Attend A. D. A., state, district, and local dental society meetings. It helps to keep a better spirit of cooperation and understanding between general practitioners of dentistry and the orthodontic profession. It goes without saying that we should attend the A. A. O. and our district orthodontic meetings. I also wish to urge that we read and study our professional publications—these editors and contributors deserve our thanks for doing a fine and necessary service."

Respectfully submitted,
Public Relations Committee.

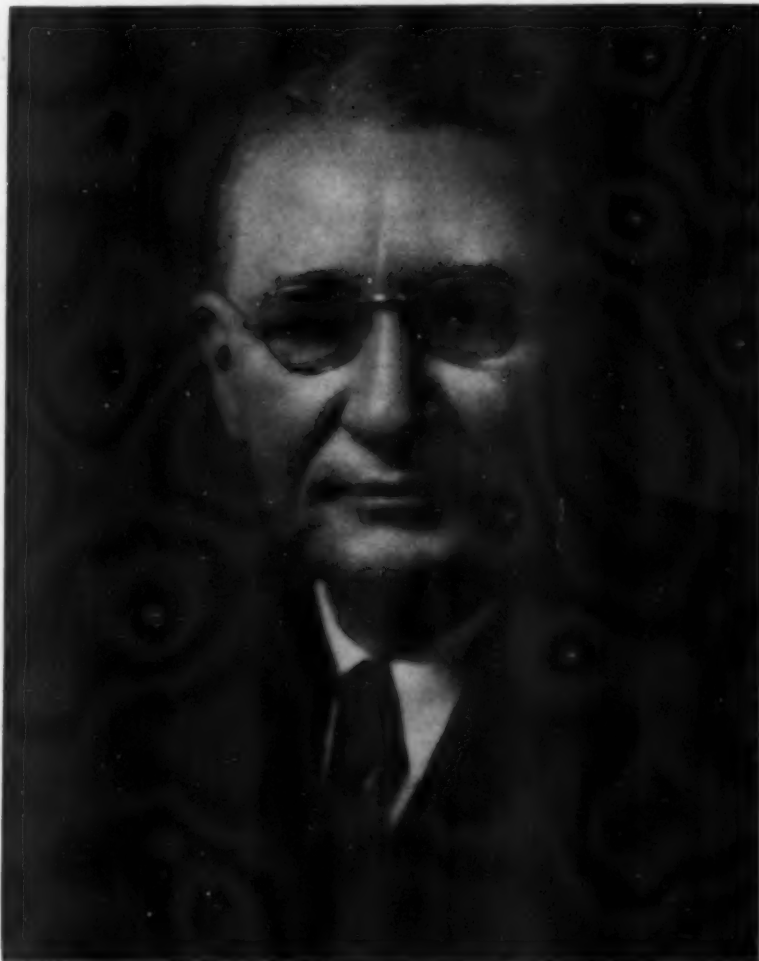
HARRY L. KEEL,
R. BURKE COOMER,
ORVILLE O. VAN DEUSEN.

In Memoriam

R. C. WILLETT

1877-1950

IT IS difficult to write in memory of a colleague, a friend, and a fellow alumnus of Washington University, School of Dentistry. Life entails death; therefore, one must submit to the inevitable. In the death of Raymond Clair Willett of Peoria, Ill., dentistry for children has lost another pioneer and a faithful servant. His name will long be remembered in the annals of dentistry.



R. C. WILLETT

Dr. Willett died Dec. 23, 1950, after a brief illness. He was active in his office until the week before the curtain fell. He was born on April 27, 1877, at Poweshiek County, Iowa, of parents whose ancestry is well rooted in American history and tradition that date back to the days before the American Revolution. It may be truly said that he was a pioneer and a descendant of pioneers.

He is survived by his gracious widow, the former Miss Ruth Wheeler, and their daughter Martha (Mrs. James Gaebe), and he is survived by his name, his works, a noble memory, and by a countless number of friends and admirers.

His scientific contributions to dentistry for children and to orthodontics are too well known to be cited again. For these outstanding contributions to dentistry, Washington University, his Alma Mater, conferred upon him, in 1941, the honorary degree of Doctor of Science. Similarly in 1946, the American Association of Orthodontists awarded him the highly esteemed Albert H. Ketcham Award. With humility he accepted these honors and continued until the very end to give his best.

His work for the children of Peoria is worthy of mention. He treated rich and poor alike. The dental clinics of the public schools of Peoria owe their existence to him and men like him.

Dr. Willett was president of Peoria District Dental Society in 1913; life member of the Illinois State Dental Society and its vice-president in 1934; vice-president of the American Association of Orthodontists for three consecutive years, 1942, 1943, and 1944; charter member of the Chicago Association of Orthodontists and its president in 1935-1936; member of Omicron Kappa Upsilon; a Fellow of the American College of Dentists; an Honorary member of the American Academy of Pedodontics. Dr. R. C. Willett left dentistry and the world in a far better shape than he found them. We owe him a debt of gratitude.

R. E. M.

WILLIAM A. (GUS) CLARKE, SR.
1892-1950

ONE OF the first men I met in the Southern Society of Orthodontists was Dr. William A. Clarke, Sr. Gus, as he was known to his friends, spent his summers in my state of West Virginia, when he was a young man. He never failed to talk about those summer vacations when we met at orthodontic meetings. So I counted myself one of Gus Clarke's many friends.

His friendly mannerism and likeable personality made friends for him wherever he went.

Dr. William A. Clarke, Sr., was born Oct. 11, 1892, at Jefferson, Ga. He was the son of Alice Hunter Clarke and W. A. Clarke.

Reared in Athens, Ga., he attended the Southern Dental College in Atlanta, where he was graduated in 1915. He returned to Athens where he practiced until he entered the United States Army and served at Camp Hancock in Augusta, Ga., with the rank of first lieutenant. Following his discharge he returned to Athens and continued his practice.

In 1925 he attended the University of Pennsylvania for postgraduate work in orthodontics. In 1926 he came to Atlanta where he opened his office for the practice of orthodontics.

He was the only southern member of the Serod Club of Massachusetts, a group which met at the invitation of Dr. LeRoy Johnson and engaged in research work.

He was a member of the Northern District Dental Society, the fifth District Dental Society, Georgia Dental Association, the Southern Society of Orthodontists, and the American Association of Orthodontists. He was past-president of the Fifth District Dental Society and the Southern Society of Orthodontists. He was a member of the Pi Kappa Alpha social fraternity and the Psi Omega dental fraternity.

He was also a member of the Military Order of World Wars, a member of the Masonic Lodge in Athens and Yarraab Temple, Shrine, Atlanta.

He is survived by his wife, Harriett Parker Clarke, and one son, W. A. Clarke.

Lives of great men all remind us
We can make our lives sublime,
And, departing, leave behind us
Footprints on the sands of time.

—Henry Wadsworth Longfellow.

BYRON WARD CORDES

1911-1950

BYRON WARD CORDES was born Aug. 1, 1911, in Crookston, Minn. His family moved to Minneapolis in 1920 where he attended grade school and graduated from Marshall High School in 1930.

In the fall of 1930 he enrolled at Washington University Dental School. After two years of premedical school and four years of dentistry, he graduated with honors, being presented with a key. Upon graduation he had the choice of two paths—attending Columbia University of New York, or associating with Dr. Frank C. Rodgers in St. Louis, Mo. After much pondering he chose the latter location.

In 1938 he met and married Dorothy Newman. Three children were born to this union: Dorothy Rae, Byron, Jr., and Ann.

In 1942 the army issued its call for reserve officers, and Byron Cordes went to Jefferson Barracks and then to Fort Leonard Wood. In June, 1942, he moved to Camp White at Medford, Ore., for rigorous physical training. He received the rank of captain. In 1944 he sailed for Italy, and while serving in the Italian campaign received the Bronze Star medal and three campaign ribbons.

In 1945 he returned home and again located in St. Louis, Mo. He belonged to many organizations. He was secretary of the St. Louis Dental Society Study Club, a member of the Society of Dental Science, the St. Louis Dental Society, the American Association of Orthodontists, the St. Louis Society of Orthodontists, of which he was president from 1949 to 1950. He was a member of the Lloyd C. Boswell American Legion Post No. 136.

He was a man of varied interests. He was fond of music; his love of sports was inherent and he excelled in many: tennis, swimming, skating, shooting, and golf.

Orthodontics has lost a promising young and vigorous worker within its ranks in the passing of Byron Cordes.

Department of Orthodontic Abstracts and Reviews

Edited by

DR. J. A. SALZMANN, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Abstracts Presented Before the Research Section of the American Association of Orthodontists, May 8, 1950

A Statistical Analysis of Cranial and Facial Dimension in the Frontal Planes Using Cephalometric Radiographs: By Walter B. Doering, D.D.S., Northwestern University.

While advancement in scientific knowledge is dependent to a great degree upon the development of new techniques, new instruments, and new methods of study, it seems at times that we pass over information too quickly without completely evaluating it. The present study proposes to examine and correlate the available data on the frontal radiograph.

The material for this thesis was derived from two unpublished theses written in 1948 at Northwestern University as partial fulfillment of requirements for the degree of Master of Science in Dentistry. The material investigated by Weinstein (group A) consisted of a group of 43 adults, aged 18 to 45, with "normal dentitions." The material investigated by MacLean consisted of two groups, 20 individuals ranging in age from 3 to 11 years (group M), and 30 individuals ranging in age from 12 to 16 years (group Y). These two groups evidenced Class II (Angle) malocclusion. The frontal radiographs were taken according to the Broadbent-Bolton technique.

The following landmarks were used by both investigators:

- Sella turcica (S)
- Frontal (F) right and left
- Zygion (Z) right and left
- Zygomaxillare (M) right and left
- Maxillary first permanent molars (6) right and left
- Gonion (G) right and left

The following angles were constructed and measured:

- Angle FSF
- Angle ZSZ
- Angle MSM
- Angle GSG
- Angle 6S6
- Angle 3S3
- Angle RPR

The Angle RPR is formed by the intersection of the tangents to the lateral borders of the upper two-thirds of the ramus.

The following linear measurements were taken:

- FF
- ZZ
- MM
- 66
- GG

The following statistics were determined for all data using standard formulae:

- Arithmetic mean
- Standard deviation
- Actual range
- Calculated range to include 95 per cent of the population
- Coefficient of variation
- Standard error of the mean
- "t" values
- Coefficient of Correlation

From the data it was determined that high negative correlation existed between frontal-sella-frontal (FSF) and zygomaxillare-sella-zygomaxillare (MSM) in all groups tested. There was a high positive correlation between zygomaxillare-sella-zygomaxillare (MSM) and first molar-sella-first molar (6S6) and MSM and cuspid-sella-cuspid (3S3). There was also a high positive correlation between first molar-sella-first molar (6S6) and cuspid-sella-cuspid (3S3). The ramus-pogonion-ramus (RPR) angle and gonion-sella-gonion (GSG) evidenced little correlation to the other angles measured.

Bifrontal width (FF) was strongly correlated in a positive manner toward bizygomatic width (ZZ) in all groups, showing that as one varied, so did the other. Lines bizygomaxillare (MM) and bigonion (GG) showed a very high positive correlation in all groups tested, as did lines bizygomaxillare (MM) and bi-molar (66).

There was extreme significant difference in bizygomatic width (ZZ) in all groups tested, with bigonial width (GG) and bi-molar width (66) also showing significant differences. Bifrontal width (FF) indicated no significant differences in all groups tested, indicating homogeneous sampling.

The negative correlation between angles frontal-sella-frontal (FSF) and zygon-sella-zygon (ZSZ) indicates a change in the position of point S. The following possibilities may be responsible for at least part of this apparent shift:

- a. Point S moves upward in relation to the bifrontal (FF) and bizygomatic (ZZ) lines.
- b. Point S moves upward more and faster than the lines move upward.
- c. The lines move toward each other as point S moves upward.
- d. The lines move apart as point S moves upward.
- e. Other factors, not tested, may be responsible for the apparent shift in point S.

A Histologic Study of the Mandibular Condyles in the Rat Following Unilateral Resection of (1) the Buccal Branch and (2) the Buccal and Marginalis Mandibular Branches of the Facial Nerve: By Henry Giddens King, D.D.S., Northwestern University.

A histologic study of the mandibular condyles of two groups of albino rats was made following unilateral resection of (1) the buccal branch of the facial (VII) nerve in one group, and the (2) buccal and marginalis mandibulae branches of the facial (VII) nerve in the other group.

The experimental material was evaluated by microscopic examination of the condyles of the operated series and compared with the histologic appearance of a series of condyles from unoperated rats. Ocular micrometric measurements were made of the width of the zones of proliferation and transition of the condyles at various age intervals in both the operated and unoperated series of animals.

No observable changes took place in the histologic picture of the condyles of the animals studied in this investigation, as a result of a unilateral resection of either (a) the buccal branch of the facial nerve, or (b) the buccal and marginalis mandibulae branches of the facial nerve. Neither could any positive conclusions be drawn from the micrometric observations.

The negative character of this investigation might possibly be the result of the limited amount of material available for study.

The Effects of Pathologic Changes in the Temporomandibular Joint on Facial Growth in the Rat as Determined by Cephalometric and Serial Radiographic Method*: By I. Robert Mannis, D.D.S., Northwestern University.

The purpose of this study was twofold: (1) to try to establish the influence of injury (infection of the temporomandibular joint on the growth of the mandible and the skull) by using anteroposterior, occlusal, and lateral radiographs taken in the Jarabak animal cephalometer, and (2) to establish the validity of measurements taken on these different radiographs.

The first aim of the investigation, in its entirety, could not be achieved because of the lack of controls and too short postoperative survival time of the younger fast-growing animals. However, a pathologic joint influenced facial growth, depending upon the degree of pathology in that over-all growth was smaller in certain directions.

The anteroposterior radiographs must be interpreted with caution because of the great difficulty of correctly positioning the long head of the rat in the cephalometer.

The validity of occlusal radiographs for the establishing of changes in the cranial symmetry has been shown.

Accuracy of measurements taken from the lateral radiographs was checked by comparing measurements independently taken by six observers. As long as measurements were taken using well-defined skeletal landmarks, the correlation of the independent measurements was good.

An Investigation of the Position of the Mandibular Condyle and Its Interpretation From Temporomandibular Radiographs: By Ted B. Martin, D.D.S., Northwestern University.

The prime objective of this thesis was to determine the reliability with which temporomandibular joint radiographs portray the actual relationships which exist in the temporomandibular joint itself. It also was thought desirable to determine the position of the condyle in the fossa by measurements from wax impressions of skull material.

Several hundred skulls were carefully examined in order to obtain thirty which presented an ideal occlusion and exhibited no noticeable shrinkage of the mandible due to loss of moisture from the bone. This shrinkage is manifested in the horizontal distance between the two condyles.

Wax impressions were then made of each joint, the mandible positioned by very carefully occluding the teeth into the previously observed proper relationship. This procedure was performed unilaterally in order that the amount of error in the relationship due to shrinkage of the mandible might be reduced to a minimum.

Each impression was then enclosed in plaster, trimmed down to the junction of the middle and lateral thirds of the condyle, and measurements taken at the three following points:

*Abstract of M.S.D. thesis, Northwestern University Dental School, Nov. 28, 1949.

A. From the anterior superior surface of the condyle to the posterior inferior surface of the articular eminence. This represents the articular surface of the joint when the teeth are in occlusion.

B. From the most superior surface of the condyle vertically to the roof of the fossa.

C. From the most posterior surface of the condyle horizontally to the anterior surface of the postglenoid tubercle.

In order to check the reliability of temporomandibular joint radiographs, each skull was orientated in Frankfort horizontal plane and the Lindblom apparatus utilized to obtain a radiograph of the articulation with the wax in place. Measurements were then made on the radiographs at the same points as on the wax impressions and the two compared statistically. Twenty sets of measurements were obtained in this manner.

A statistical analysis of the measurements thus obtained indicated that carefully orientated radiographs give an accurate portrayal of the relationships which actually exist in the temporomandibular joint.

Due to the variable amount of shrinkage and distortion present even in carefully selected skulls, mean values found for the measurements on the skull material would not necessarily coincide with mean values of the living population. It can be stated, however, that the distance at point A is the smallest of the three and also is more constant than those at points B and C.

The average distortion produced by angulation and distances such as those used in the Lindblom apparatus is approximately 0.25 mm. The possible maximum distortion in any given case would not be over 1 mm. Distortion implies changes in size only and not changes in relationships of the joint structures.

A Cephalometric Roentgenographic Comparison of the Upper Face and Associated Structures in Class II, Division 1 and Class III Malocclusions of the Teeth: By Willis J. McCormick, B.S., D.D.S., Northwestern University.

The purpose of the thesis was to determine if there are any essential, or characteristic, differences of the maxillae and associated structures in Class II, Division 1 and Class III malocclusions of the teeth; and, if such differences exist, to determine their magnitude.

The data were obtained from tracings of lateral head radiographs, obtained by utilizing the Broadbent-Bolton cephalometer to position accurately the head and film cassette during exposure. The tracings consisted of the anatomical components of the upper face and associated structures, and the posterior arch and tubercle of the atlas, or first cervical vertebra. The mandible and associated structures were omitted from the tracings. The Class II, Division 1 sample consisted of 35 individuals, and the Class III sample consisted of 34 individuals.

Angular measurements were made to attempt to relate certain maxillary dental structures, which are frequently discussed in cephalometric analysis of orthodontic cases, to the cranial base. Linear measurements were made between the various structures of the upper face in order to visualize the relationship of these structures to each other in terms of proportion. In addition, indices were established between certain of these measurements.

The data were subjected to biometric analysis, the results of which indicated that there are no essential differences in the relationships of the structures of the upper face, either to each other or to the cranial base, in cases of Angle Class II, Division 1 malocclusion and Angle Class III malocclusion, with the exception of variations in arch length which are commonly noted clinically.

News and Notes

Tentative Arrangement of Program for A.A.O. Meeting in Louisville, Ky.

Monday, April 23, 1951

9:00 A.M. to 12:00 Noon Research session.

2:00 P.M. to 4:30 P.M.

The program will be arranged according to related subject matter rather than by institutions where the research work was performed. Adequate time will be allotted for discussion of the presentations.

7:00 P.M. Stag dinner.

Dinner for ladies.

Tuesday, April 24, 1951

9:15 A.M. Invocation.

Address of welcome.

Response by President-Elect, Bernard G. deVries, Minneapolis, Minn.

9:30 A.M. President's address, Joseph E. Johnson, Louisville, Ky.

9:45 A.M. A paper on temporomandibular problems of interest to the orthodontist, by Dr. Elam Harris.

10:30 A.M. A presentation by a periodontist on occlusal equilibration, by Dr. Blair C. Madsen. Drs. Harris and Madsen are collaborating on their presentations. Dr. Madsen will supplement his paper with a practical demonstration in the general clinics.

11:15 A.M. A practical summary of cephalometrics and a presentation of growth patterns resulting from the Bolton Study, by Dr. B. Holly Broadbent. This paper will be supplemented by a practical demonstration, in the general clinics, of clinical models of the Bolton cephalometer.

12:15 P.M. Past Presidents' luncheon.

12:15 P.M. Ladies' luncheon and style show.

Tuesday Afternoon

2:00 to 5:00 P.M. General clinics.

Wednesday, April 25, 1951

9:15 A.M. A historical presentation with interesting data about the past presidents of our association, by Dr. Leuman Waugh.

10:00 A.M. A summary on the practical and research orthodontics of Europe, by J. A. C. Duyzings. A table clinic on removable appliances will also be presented by Dr. Duyzings, of Utrecht, Holland.

10:45 A.M. Presentation of the Albert H. Ketcham Award.
The American Board of Orthodontics.

11:15 A.M. A serial study of good occlusion from birth to 12 years of age, by Dr. H. Sillman.*

12:00 International luncheon.

Wednesday Afternoon

2:00 P.M. A biographical sketch of Dr. T. Wingate Todd's life and his influence on orthodontics, by Dr. W. M. Krogman. Dr. Krogman will also report his latest research findings.

*Thesis submitted as partial requirement for certification by the American Board of Orthodontics.

- 3:00 P.M. Orthodontics at the Mid-Century White House Conference. Attended by J. A. Salzmänn and George R. Moore, representatives of the American Association of Orthodontists. Reported by J. A. Salzmänn.
- 3:15 P.M. A paper on treatment of cases using the edgewise technique, by Dr. Glen Terwilliger.
- 4:00 P.M. Business meeting.
- 6:30 P.M. Reception and banquet honoring President and Mrs. Joseph E. Johnson.

Thursday, April 26, 1951

- 9:15 A.M. Habits as an Etiologic Factor of Malocclusion, by Dr. Kyrle W. Preis, and supplemented by a movie, "Habits in Action." Drs. Whitman and Preis are collaborating in their presentations.
- 10:00 A.M. Cases complicated by muscle perversions corrected by patient education and co-operation. Presented by Dr. Clifford Whitman.
- 10:45 A.M. An evaluation of methods of prevention and control of dental caries. The control methods to be stressed because of greater practical interest to the orthodontist, by Dr. Gerald J. Cox.
- 11:30 A.M. A System of Treatment With the Universal Appliance, by Lt. Col. Wm. H. Day. Luncheon.

Thursday Afternoon

- 2:00 to 4:15 P.M. Symposium on Orthodontic Diagnosis and Case Analysis, by Drs. C. W. Carey, Wm. B. Downs, and Ashley Howes.

The letter below was sent out to the members of the American Association of Orthodontists, under date of Jan. 18, 1951, by Dr. George R. Moore, Secretary.

The letter explains itself, and is published herewith in order to give as wide publicity as possible to the approval of the American Board of Orthodontics by the American Dental Association.—*Editor*.

Dear Doctor:

The American Board of Orthodontics has now qualified for approval by the American Dental Association, according to the requirements set up by the Council on Dental Education.

The terms will be printed in the February issue of the AMERICAN JOURNAL OF ORTHODONTICS, and are the standards of future action by the Board beginning with its meeting in 1952.

The American Board of Orthodontics will continue to accept applications under its existing rules of eligibility until March 25th, 1951.

Members desiring to qualify under the present rules should file their applications with C. Edward Martinek, Secretary, 661 Fisher Building, Detroit 2, Michigan.

Very truly yours,
George R. Moore.

Research Section, American Association of Orthodontists

A session for the presentation of research papers will be held on Monday, April 23, 1951, at the meeting of the American Association of Orthodontists, at the Seelbach Hotel in Louisville, Ky.

Members of the American Association of Orthodontists, persons affiliated with recognized institutions in the field of dentistry as teachers, research workers, undergraduate or graduate students who wish to participate in this program are invited to submit the following information for the consideration of the Committee, to Dr. J. A. Salzmann, 654 Madison Ave., New York 21, N. Y.: (a) the exact title of your paper; (b) the institution where this work was done; (c) an abstract of your paper of not more than 50 words.

Wendell L. Wylie, Chairman,
J. A. Salzmann,
R. E. Moyers,
Committee on Research,
American Association of Orthodontists.

Southern Society of Orthodontists

The meeting of the Southern Society of Orthodontists will be held at the Greenbrier Hotel, White Sulphur Springs, W. Va., July 31, Aug. 1 and 2, 1951.

Central Section of the Pacific Coast Society of Orthodontists

The meeting of the Central Section of the Pacific Coast Society of Orthodontists was held at The Family Club, 545 Powell St., San Francisco, on Nov. 10, 1950.

Members and guests present were: Allen E. Scott, Wm. S. Parker, Lyle D. Russell, Robt. B. Murray, George W. Hahn, J. F. McMath, Jr., Thos. E. Lewis, John E. Duman, Fred E. Havrilla, Arthur F. Skaife, Seymore B. Gray, Peter J. Ceremello, Lewis H. Guy, J. Kester Diment, Lloyd M. Cox, Robert E. Kemp, Arthur J. Corbett, Benj. Ledyard, Jr., Peter J. Picard, Harry S. Thompson, Ray Lussier, Leland E. Carter, Earl F. Lussier, Cecil S. Rand, Vernon Hunt, Charles Biedinger, Wm. S. Smith, C. W. Konigsberg, F. W. Heitman, Jr., Kenneth E. Stratton, Norman Snyder, C. W. Carey, Alan R. Cass, Eugene E. West, E. L. Johnson, Phillip Konigsberg, Fred Epley, Roy C. Cowden, Howard H. Jan, Reuben Blake, George H. Grover, Wilfred M. Wong, Raymond Brownell, K. F. Terwilliger, E. Wilden Ballard, G. H. Terwilliger, Joseph Martinez, W. Robert Campbell, Robert Ramsey, James R. Seaman, William Padden, Wendell L. Wylie, and Walter Straub.

The meeting was called to order at 9:00 P.M. by Chairman Ray Lussier.

A letter from Fred West notifying the Secretary of admission to regular membership of the following men was read:

John Adams, 1684 E. 14th St., San Leandro, Walter R. Bell, 505 Chestnut St., Reno, Nev., W. Robert Campbell, 2015 Pacific Ave., Stockton, Calif., Peter J. Ceremello, 1904 Franklin St., Oakland, Calif., Lloyd M. Cox, 1049 Fourth St., Santa Rosa, Calif., T. N. Engdahl, Jr., Medico-Dental Bldg., San Jose, Calif., Fred W. Heitman, 1715 L St., Merced, Calif.

The name of Vernon L. Hunt, Eureka, Calif., was placed in nomination for the office of member of the Board of Directors to fill the position created by the expiration of the term of office of Director William Walsh of Stockton, Calif. The nomination was seconded by C. W. Konigsberg, and he was unanimously elected.

Kester then reported upon the recommendations of the Nominating Committee for the officers for the year 1951, as follows:

Chairman, Roy C. Cowden.
Secretary-Treasurer, C. W. Konigsberg.
Program Chairman, Raymond Brownell.

Chairman Lussier thanked the officers who served with him during his term for their actions in carrying out the duties of their offices, and the meeting was turned over to the new chairman.

Chairman Cowden thanked the membership and then introduced the program chairman of the evening, Chas. Konigsberg, who in turn introduced Wendell Wylie who expressed his pleasure in once again meeting with the members of the Central Section and in returning to the University of California.

Chas. Konigsberg then introduced the speaker of the evening, Walter Straub of San Mateo, who gave an interesting discourse and showed slides depicting: "The Interference of Pressure Habits and Their Effects on the Occlusion and Facial Anomalies."

Southern Section of the Pacific Coast Society of Orthodontists

The regular quarterly meeting of the Southern Section of the Pacific Coast Society of Orthodontists was held at the home of Spencer Atkinson, 2147 North Villa Heights Road, Pasadena, Calif., on Friday, Dec. 8, 1950. Merle Davis again took the place of Harry Faulkner as chairman.

Officers newly elected at this meeting are: John Hopkins, Chairman; Merle Davis, Secretary-Treasurer; and Harvey Spears, member of the Board of Directors. Approvals of the applications for membership of the following men were voted:

Albert C. Funk, 2150 Fourth Ave., San Diego, Calif., and Fay C. Van, 1245 Glendon Ave., Los Angeles 24, Calif.

The group voted upon and adopted the recommendations of the membership committee as reported by James McCoy. The Secretary was instructed to send copies of Dr. McCoy's letter to the Central and Northern Sections. The Secretary-Treasurer reported \$1,650.94 on hand as of December 8. John Abel presented a plea for support from the Southern Section in the purchase of equipment for the new dental school at the University of Southern California. The Southern Section voted to contribute \$1,000 to the equipment fund payable in three equal installments beginning in 1950.

It was voted to cancel the March meeting of 1951 because of the meeting of the Pacific Coast Society in February at San Francisco.

After the business meeting, Dallas McCauley, Chairman of the day, presented Spencer Atkinson. The group spent the rest of the afternoon examining the fine exhibit of skulls and microscopic specimens displayed in his laboratory.

The evening was devoted to a lecture with slides that was given by Spencer on "The Practical Application of Anatomical Findings in Orthodontic Treatment."

Members present at the meeting were: John R. Abel, Charles M. Alderson, William J. Armstrong, Spencer R. Atkinson, R. D. Andrews, W. Mahlon Adams, W. E. Bedford, Berneice Barkelew, Earl R. Crane, J. F. Conrad, Merle B. Davis, Fairman J. Fahrney, Walter J. Furie, Calvin C. Gaverick, Eugene I. Gould, Robert J. Gawley, A. C. Heimlich, John Hopkins, R. Paul Husted, James R. Johnson, E. M. Johnston, Roscoe L. Keedy, Charles D. Lindesty, Jess A. Linn, Robert A. Lee, Dallas R. McCauley, John R. McCoy, James D. McCoy, Fred McIntosh, Herbert V. Muchnic, Anthony Moore, Cecil W. Neff, George Nagamoto, Townsend B. Paul, Ben L. Reese, John S. Rathbone, Herbert Shannon, L. R. Sattler, C. E. Thompson, George L. Turner, and Robert L. Whitney.

Guests present were: John V. Avakian, D. V. Anderson, Douglas H. Bennett, Henry H. Bowman, George Boone, Warren G. Brown, Harvey J. Cole, Lloyd Cottingham, C. R. Darsey, W. C. Dorsett, Jr., Burton L. Fletcher, A. L. Funk, Ted Gettinger, Merton E. Hill, Jr., Philip L. Klein, Charles F. Mitchell, Seth G. MacArthur, Kenneth D. Raak, Owen E. Ridgeway, Gene Springer, and Fay C. Van.

Spencer R. Atkinson*

The Squire of Sierra Madre and his good wife have developed something unique in the annals of orthodontic history.

*Reprinted from the Bulletin of the Pacific Coast Society of Orthodontists, December, 1950.

Not only have they built a beautiful home and orthodontic research laboratory, but a small animal contingent from the surrounding hills have found a sanctuary; they can come each night and find their evening meal awaiting them on the wide, front yard of the Atkinson menage. A similar evening dinner was served for years at the former home in Altadena, which served as a locale for the many child books and magazine stories by Mrs. Atkinson. The little family of Ringtails, the Skunks, Raccoons, the 3-footed Fox, with the collar on his neck, and a transient Coyote, now and then, were the old friends and nightly visitors. I wonder how many of old friends have followed the Squire and the Authoress to their new home, a distance of some 5 miles. The home life, in the old home in Altadena, is woven into the many stories and books from the pen of Mrs. Atkinson, and the many experiments and much research done in the basement, created a desire to share their lives, to give their wealth of knowledge, and to create a place for others to meditate and study the orthodontic problems that had been on their minds for years.

The new laboratory and home are high upon the side of the Sierra Madre Mountain range, with a breath-taking view of the entire metropolitan district of Los Angeles and a back drop of the Sierra Madres reaching 4,000 feet further into the sky. It all forms a perfect haven for the Atkinsons to live their lives and do their chosen work. However, the Squire's dream is only partially complete: Like the open door of a sacred edifice, its portals are always open to the seeker of orthodontic knowledge. Men from all over the orthodontic world have discovered this fact, and the open guest book already has a long list of notables who have availed themselves of that privilege, and many others are coming.

What a privilege it was to have held our last P.C.S.O. meeting there and see with our own eyes what the Squire of the Sierra Madre was doing in behalf of orthodontics and the World of Science, as well as himself and his good wife.

We salute Dr. and Mrs. Atkinson.

Florida Orthodontic Group

The annual program of the Florida Orthodontic Group was held at Tampa, Fla., on Feb. 12, 13, and 14, 1951.

Dr. Oren A. Oliver and Dr. H. K. Terry presented the bulk of the program as follows:

Basic Theory of Labiolingual Technique.

Direct Molar Band Technique (Slides).

Construction of Lingual Appliances (Slides).

Lingual Auxiliary Attachments (Slides).

Construction of Labial Appliances (Slides).

Labial Attachments (Slides).

Principles of Oliver Guide Plane.

Construction of Guide Plane (Slides).

Construction of Guide Plane. Step by Step. (First half of class).

The Guide Plane and the Temporomandibular Joint. Step by Step. (Second half of class).

Construction of Guide Plane.

Cases: Diagnosis and Treatment Planning.

Movie on Guide Plane.

Diagnosis and Treatment Planning. Dr. Boyd W. Tarpley, Birmingham, Ala.

Dutch Society for the Study of Orthodontics

At the meeting of the Dutch Society for the Study of Orthodontics, held on Jan. 20, 1951, at Utrecht, Holland, Dr. George R. Moore, of Ann Arbor, Mich., and Dr. Clare K. Madden, of Greenwich, Conn., were made honorary members of the society.

American Association for Cleft Palate Rehabilitation

The meeting of the American Association for Cleft Palate Rehabilitation will be held at the Bellevue-Stratford Hotel, Philadelphia, Pa., April 27 and 28, Dr. Robert L. Harding, 813 North Second St., Harrisburg, Pa., Chairman.

Medical Care for Men Wounded in Battle

Medical care for men wounded in battle is a topic of immediate and intimate concern to every American family today.

Recent official casualty reports show over 28,000 men wounded in Korea who must be cared for in military hospitals. In only the last few days casualty lists have mounted. Reverses in Korea are immediately reflected, not only in territorial losses but, more tragically, in the numbers of men injured. Thousands have already been evacuated to the United States; more will be returning in the immediate weeks ahead.

To provide adequate nursing care for these men, the Army Nurse Corps must assign 3,000 additional nurses at once.

This is a large number of qualified women to be drawn out of civilian practice. But, with the help of the American Nurses Association, and with the understanding of every American, we believe the job can be done without depleting any one community of its limited nursing resources. The American Nurses Association has already established State quotas based on the available nurse populations of each area and will cooperate with us in a program to urge those nurses who can volunteer for military service to do so immediately. We, in turn, have agreed not to accept nurses who are essential to the community health program. We need bedside nurses, surgical nurses, and anesthetists primarily. We do not want instructors in schools of nursing, nursing administrators, or other key individuals in hospitals and health agencies. We are entirely in accord with the views expressed by so many national health authorities—that the structure of the whole Nation may be weakened seriously if there are not enough nurses to meet the needs of the sick at home. But we also believe—as I am sure you do—that each community must give up some of its nurses to care for the men it is giving in the Nation's defense.

We in the Army Nurse Corps are proud to report that only ten days after hostilities began in Korea, the first detachment of Army nurses arrived in Pusan with a mobile surgical hospital, ready for duty directly in support of combat troops. Since that time, over 300 Army nurses have been assigned for duty in Korea—most of them volunteers from the staffs of our hospitals in Japan. We now have a long waiting list of nurses in Japan who are eager to go to Korea if and when they are needed.

Our nurses in Korea are attached to field hospitals and mobile surgical units and have cared for casualties from every major ground forces action in which United Nations troops have been engaged. These hospital units are set up in tents or abandoned buildings near the front and receive casualties from battalion aid stations further forward. In these improvised hospitals, the seriously wounded receive immediate surgery and nursing care—a combination which saved the lives of 97 out of every 100 men wounded in World War II. Vast quantities of penicillin and other antibiotics reduce wound infection, and whole blood and plasma are employed to prevent surgical shock. Skilled surgeons and highly trained surgical nurses perform emergency surgery and nurses specially qualified in postoperative nursing procedures care for the patient until his condition is satisfactory for evacuation by plane or hospital ship to Japan.

Hospitals in Korea must be ready to move at a moment's notice. They must go forward with the troops, or withdraw when required by enemy action. Living and working conditions for our nurses, therefore, require stamina, courage, and a high degree of professional ingenuity and skill. For example, one hospital was housed for a time in an abandoned rice mill, and the fumes of ether and disinfectant mingled with the musty odor of

rice chaff as the nurses worked. A treatment room for patients able to walk was hastily set up amidst sacks of rice in a storeroom in the front of the mill and, in the rear, machinery was moved out to make room for litter cases. Gasoline stoves kept instruments boiling and portable generators provided power for lights in surgery.

Although mobile hospitals are basically 60-bed units, hundreds of patients may be admitted in one day when intense infantry action is under way. Nursing care, therefore, is a round-the-clock challenge—there is little time for rest, none for recreation. But it is a tribute to all nurses that their colleagues in Korea do not want to come home until the fighting is over.

In Japan, every Army hospital is crowded. We were fortunate in having over 500 Army nurses on duty in the Far East when hostilities began—which made it possible for us to provide immediate care for casualties.

Today, however, every nursing service in every hospital in the Army Medical Service is operating with fewer nurses than the minimum number required in proportion to its patient census. Several hundred nurses have already been transferred from Army hospitals in the United States to the Far East Command to reinforce the overworked nursing staffs of hospitals there. The load and the nursing care responsibilities are not diminishing—they increase each week. But the number of nurses on duty with the Army is not increasing in equal ratio.

This situation, plus future military expansion, makes it imperative that each community now analyze its nursing resources and help us find those qualified young women who can be spared for service with the Army.

We do not believe that our present needs are excessive—3,000 represents less than 1 per cent of the current graduate nurse population. And it is our fervent hope that world conditions will not require us to put many more than this number of young women in the uniform of the Army Nurse Corps in the year ahead. We cannot attain our goal, however, unless each family—every wife, mother, sister, and father of every boy in the service of his country—will recognize that the Army nurse is essential to that boy's future well-being.

Notes of Interest

P. C. Hull, Jr., D.D.S., announces the removal of his offices to Suite 6-H, Doctors Bldg., 1012 Kings Drive, Charlotte, N. C., practice limited to orthodontics.

Thomas J. Kelley, B.S., D.D.S., announces the reopening of his office for the practice of orthodontics at 98 Suffolk St., Holyoke, Mass.

Dr. Howard Yost announces the association of Dr. Dorothy Denzler in the exclusive practice of orthodontics at 803 West Division St., Grand Island, Neb.

Dr. Francis Sugiyama announces the opening of his new office in the Professional Bldg., Kinoole and Kalakaua Sts., Hilo, Hawaii, practice limited to orthodontics.

Dr. Wayne L. Zeiger announces the removal of his offices from 1304 First Security Bank Bldg., Salt Lake City, Utah, to the Medical Arts Bldg., 131 North Third St., Las Vegas, Nev.

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The AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and the following component societies. The editorial board of the AMERICAN JOURNAL OF ORTHODONTICS is composed of a representative of each one of the component societies of the American Association of Orthodontists.

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